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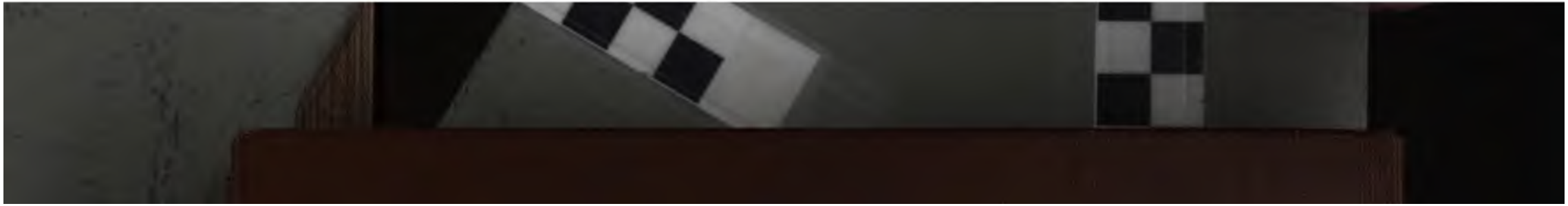
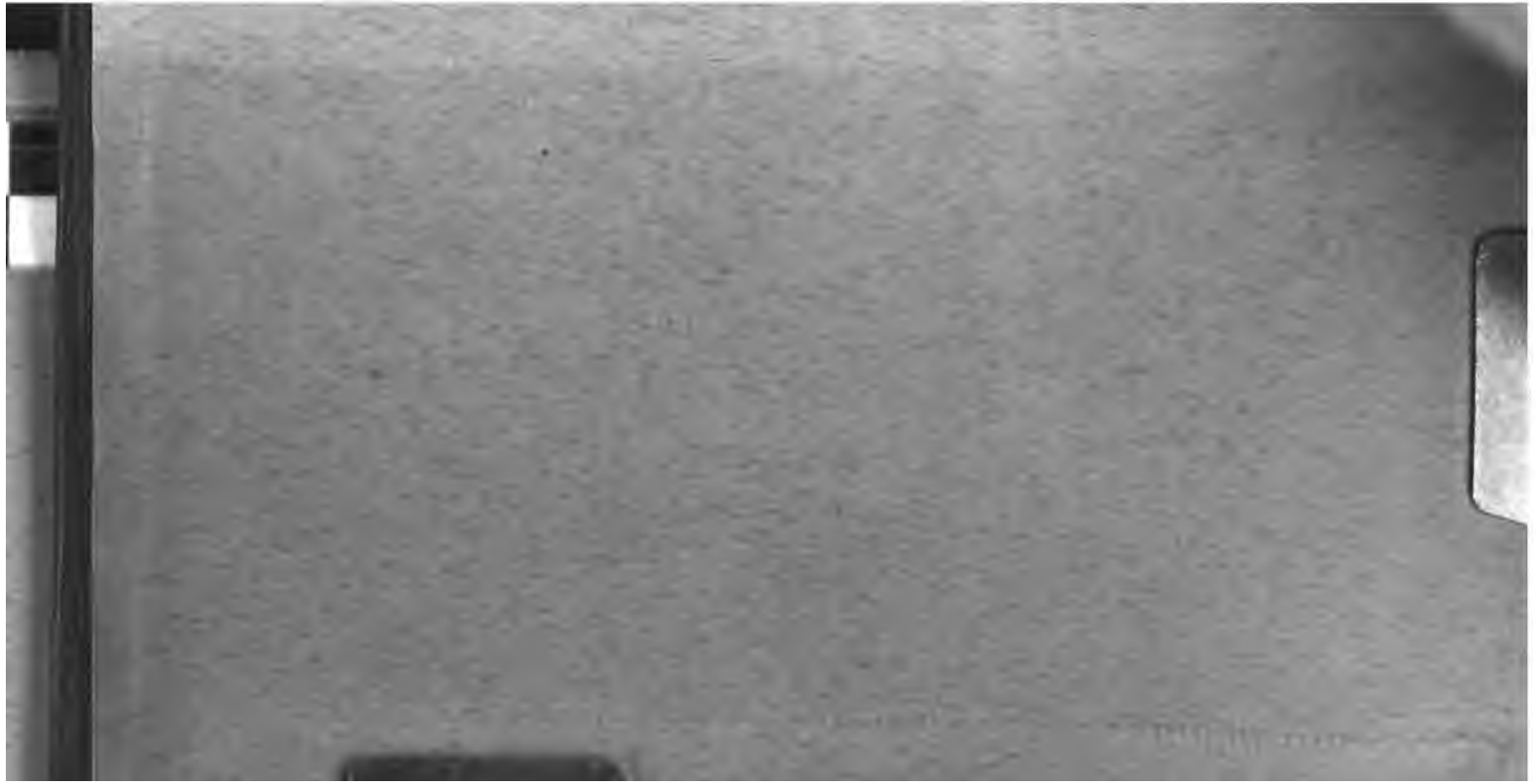
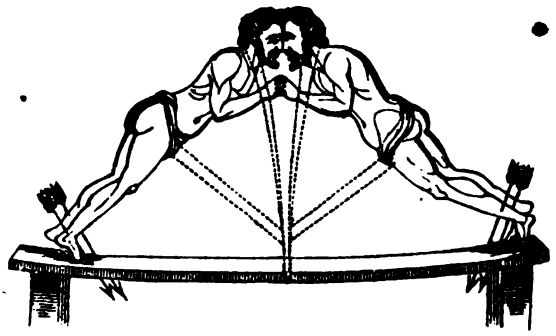
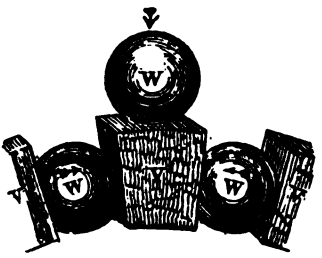






Mechanical truss the means of power and economy in construction
§ 434.

SPECIFICATIONS.



Concentration and compression the source of stability and duration in architecture.
§ 416.

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SPECIFICATIONS

FOR

PRACTICAL ARCHITECTURE

PRECEDED BY

AN ESSAY

ON THE DECLINE OF EXCELLENCE

IN THE STRUCTURE AND IN THE SCIENCE OF MODERN

ENGLISH BUILDINGS;

WITH THE PROPOSAL OF REMEDIES FOR THOSE DEFECTS.

BY

ALFRED BARTHOLOMEW,

ARCHITECT.

You seem surprised: which does not surprise me; because, I imagine, you are not at all aware of the true meaning of the verb To BUILD; which has been much degraded amongst us by impostors. There seems therefore to you not to be the least shadow of corresponding signification between the verb and its participle. HUTS and HOVELS, as we have already seen, are merely things *raised up*. You may call them habitations, if you please; but they are not *Buildings* (i. e. *Buildens*:) though our modern architects would fain make them pass for such, by giving to their feeble erections a strong name. Our English word To BUILD is the Anglo-Saxon Byldan, to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places.—DIVERSIONS OF PURLEY.

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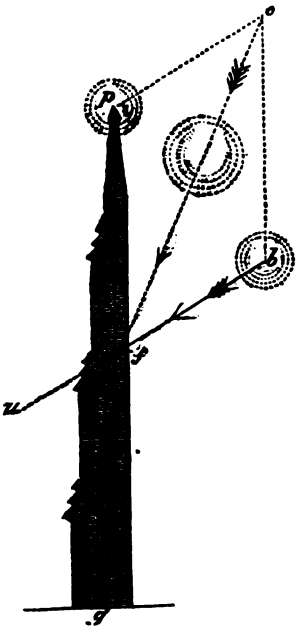

Key to the Stability, Economy of Material, and Picturesqueness of Pointed Architecture.
§ 472.

GILBERT & RIVINGTON, PRINTERS, ST. JOHN'S SQUARE, LONDON.

PREFACE.

I. This work has arisen from a desire of rendering more exact the descriptions which are requisite for the contracting for and the manipulation of buildings.

II. From an early age, having been much accustomed to the production of this description of writing, I have acquired some facility in such labor, and have gradually collected a considerable stock of examples, all of my own composition.

III. When, more than twenty years ago, I began this description of technical literature, I found generally prevalent in it a coarse style of vagueness, which though itself little imaginative, left ample room upon a thousand points for Builders to exercise imagination as to the intentions of the writers of it: it has required a good deal of practice to reduce gradually the technical expressions necessary in descriptions of work, to that clearness and to that simplicity, which in my opinion, should ever pervade such documents.

IV. The man of many self-elected professions, who secretly considers himself gifted with taste, or who has egotism enough to avow openly such an exalted opinion of his mind or talents, will no doubt disesteem such a description of writing: such a person having rarely wealth, estate, or power, if he trouble himself about building, only looks to superficials; and having nothing to pay for the enjoyment of his taste, disregards every means of producing architecture: but to the noble, the governor, the man of estate, or the busy merchant, (who before he *can* build, whether from public duty, or for investment of capital, has to go through and to consider the detail of an intended work, the means of performing it, the gathering funds for the requisite outlay, and the taking measures for success in the undertaking,) to him such matters are of deep interest; or if he chance to be so superficial, or so negligent, as to disregard them, he learns by costly experience to be more cautious in the next fabrication in which he is concerned.

V. The Specifications contained in this work, are entirely of my own composition ; more than forty of them I have chosen from a large collection lying by me, of papers composed for works intended for execution ; and the works of thirty-two of these have been carried into absolute execution, principally under my own immediate superintendence : they have therefore, of necessity, some of that precision which can alone result from the consideration of works seriously intended to be undertaken : the remaining specifications, which have indeed more of the character of elementary details than of complete works, were purposely composed for this publication, and are intended less as complete specifications, than for amalgamation with others.

VI. All the specifications which have not been expressly composed for this work, have been revised with considerable care, and many notes and explanations have been added to them : they no doubt contain many errors of composition and many wants of correctness ; but in the thirty-two of them which have been carried into execution, no omissions or vulnerable parts were discovered during the progress of the works for which they were composed ; and no disputes upon them arose with the several contractors who were employed.

VII. Some excuse for errors of the press in the first edition of a work so entirely technical, will be found by those who know how difficult is the correct printing of new works of such a kind, without they are stereotyped, and thus admit of constant revisal till the very eve of publication.

VIII. Were the collection and arrangement of these specifications even to prove uninteresting to the professional or to the general reader, my labor would be far from lost ; for from their classification, they would abundantly repay me in my future professional labors, by furnishing me with a series of examples forming a ground-work, for addition to, or for deviation from, in the composition of other specifications.

IX. I would recommend those who intend to make use of this work, for abridgment of their professional labors, to obtain interleaved copies of it, upon the blank pages of which they can write their own particular opinions and modes of practice : they could thus retain for ready use every improvement in knowledge or practical experience, and thus also not have to begin again with every new occasion.

X. I think the practitioner will find that the quality of his documents

will improve while his labor will diminish, by pursuing my own mode of, in new works, transcribing and improving from former documents the applicable parts of them, and adding all the new parts specially requisite: this method almost insures an aggravation of exactness in describing the qualities of materials, which sometimes require four, six, eight, or more separate nouns or qualifying words for that purpose; whereas by trusting in such compositions solely to memory, many of the most important descriptive words will be forgotten.

XI. A Clerk or an Amanuensis can be set to transcribe such articles from one or several of the specifications as the practitioner may esteem most: these articles can afterwards be altered retrenched amplified or improved as may be deemed fit: the several articles of this work being marked with sectional numbers for the purpose, the practitioner needs only to give his amanuensis, a memorandum of the numbers and order of the different sections which he desires to be copied.

XII. I beg to give one strong recommendation, which is, *never attempt to describe in one paragraph, several things of different qualities; for the exceptions and the qualifyings which such sentences require, render them both more troublesome to compose and to refer to; while for the saving of only a few common words, great ambiguity, if not contradiction, is the almost constant result.*

XIII. Artificers should have each part of their work so clearly and distinctly described, as to need no gloss or comment, but so as that they may without dispute set about it directly.

XIV. While this work has been in progress, I have seen occasion for enlarging it considerably more than one half beyond the original intention; and the engraved demonstrations of it have been increased twelve-fold.

XV. As there has been a great deal of thought bestowed on this work during its progress, the printing of it has occupied more than two years: I have searched diligently through a great number of publications, for enlargement of my knowledge, or for confirmation of that which I before possessed; and I have visited many buildings for the same purpose: the result has been, that if in addition to my producing a fund of orthodox and sterling opinions of practice from the greatest architects of different ages, I have made no new discoveries,—I have at least mentioned some things which are not to be found in the works of any previous writer.

XVI. As in the body of the work itself, I have gone so largely into that which I conceive to be a depreciation both of the taste and structure of buildings, it is not necessary for me to enlarge here upon that subject; but I hope hereafter to be able to prove satisfactorily to most candid and inquiring minds, THAT PURE TASTE IN ARCHITECTURE HAS IN ALL PAST AGES BEEN PURELY STRUCTURAL; *and that a departure from this wisdom is the true cause of the* TASTE *(or to speak more properly the* WANT OF TASTE) *in modern architecture being* SO VARIABLE, SO CAPRICIOUS, SO MUCH QUARRELLED ABOUT, SO MUCH QUESTIONED, AND SO SHORT-LIVED: this certainly must be the cause why our employers sometimes laugh at, and sometimes wholly interdict, the extraneous ornaments which we propose, though many of them are still willing enough to allow us, at whatever cost, the use of every thing, whether ornamental or not, which can be referred to some utility.

XVII. I am sure that the Greeks, from the exercise of judgment little assisted by their immature science, made their architraves high massy and expensive: *this was purely structural.*

XVIII. I am equally certain, that the Romans having through the advance of science, acquired the art of relieving by concealed arches their architraves from superincumbent weight, made those architraves lighter and less massy: *this too was purely structural.*

XIX. A lighter burthen to support, of consequence led to a reduction of the bulk of columns: hence arises the grudging spirit, with which every practical architect is aware an employer now views the construction of a Grecian Doric Portico, which from mass alone of material costs usually more than one of a richer but lighter order.

XX. I am no less sure, that the Pointed Architects having by a refined Philosophy cut away burthensome crowns from arches, what remained of their materials became of necessity Pointed arches, and constructively so, although their invention is imagined by the superficial to be merely an affair of taste.

XXI. In Pointed Architecture, all is structural, from the Boss*

* The difference between Bosses being structural, and merely ornamental, may be seen by comparing any ancient ecclesiastical vaulting with Inigo Jones's lower vaulting of Lincoln's Inn Chapel, which has hardly been built one third part of the time of the

which confirms the Arch-ribs (radiating from it as the spokes radiate from the nave of a wheel,) to the wall-buttress which receives the energy of the vaulting most artfully conducted down the vaulting-ribs through the flying-buttress and innoxiously dissipated on the ground itself: all is structural, from the rudderlike pinnacle which suddenly diverges into the substance of the wall-buttress the drift of the vaulting, to the triforium-arcade, which bestows economical use and elegance to the interior of the fabric, while it relieves from unnecessary weight the great columns, supporting the clere-story, the energy of the vaulting having passed over its head to without the building.

XXII. In Pointed Architecture, all is structural from the brazen filleting which sustains the detached shafts of the Early English piers, to the mullions which sustain the glass of the windows and prevent the storm from blowing it in.

XXIII. The modern man of taste would imitate the groined vaults of Pointed Architecture, *merely because they are groined*, but the free-mason groined them *because he would so relieve from thrust and weight the window-heads, voids and other weak parts of a fabrick.*

XXIV. The free-mason formed the ribs of his vaults to receive all the energy of the vaulting, and to pilot all the active force away from the window-heads, and to collect it together and unite it in the solid work communicating with the ground: but the modern man of assumed taste has no motive in the use of his rib-work except to please his eye: his child playing with his toys, and he with his rib-work, are on a level; the child blows soap-and-water bubbles at no cost, but the father injures and wastes the substance of his employer with bubbles of a more burthensome nature.

XXV. The free-mason spread his rib-work as artfully and in proportion of lightness and tenacity almost with the daring and success with which the spider spreads his web; while a large portion of modern rib-work is but a parasitical burthen upon vaulting scarcely able to sustain itself.

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former: in Jones's work the bosses instead of confirming and adding strength to the ribs, were merely hung up to the ribs which were weakened by mortise-holes for their reception, an enormous number of them have consequently fallen off: if the vaulting still remain firm, that firmness is solely owing to an excess of material; for ribs of the true grace and lightness, would not have borne with impunity, the operations of mortising and the detachment of the bosses.

XXVI. I could mention many other things, to prove that pure taste in architecture was in all former ages purely structural.

XXVII. All these points of structure were the keys to every thing else in architectural design: excellence of workmanship, intrinsic material, and the wisest structure of the time, were united with such artfulness, and with such a beauty of thinking, that the several styles of architecture in different ages and in different countries were as highly wrought and beautiful as they were distinct, and were constantly progressing in science, with the exception of those minor fluctuations which at times threw art back for a season, till it revived and throve again more beautifully. The most minute works of sculpture of the Greeks and Romans, and the shrine-work and screens of the free-masons, were frequently only miniature copies of their gigantic structural works.

XXVIII. I know that this doctrine cannot be understood by the superficial un-architectural writers upon architecture and upon architectural taste; to them convenience, adaptation to the purpose, duration, and the other cardinal properties which are to be found in all the works of the Almighty, and which every wise man endeavours to imitate in his buildings, pass for coarseness and common-place vulgarity; they forget that all inventions in Architecture have resulted from the calls of necessity and utility; the discoverers of them designing and elaborating as new wants demanded their efforts: under this feeling, they produced works in the highest degree artistic, without claiming to be artists; while all the works which have been professedly undertaken upon artistic principles, to the conformation of which no motives of structure have led, and consisting only of old inventions worked up afresh, (but of necessity degenerate as all secondary works are,) have been constantly questioned upon the very artistic grounds upon which they were professedly formed.

XXIX. The unstructural pretender to architecture, gives fine names to that which he would have us to imagine to be taste; he would surprise the ignorant with a confusion of classical terms; he would have one to believe, though all famous architects have known how to build, and he is destitute of such science, that he has obtained exclusive society with the *Genius of Architecture*, but his Bella donna translated into plain English turns out to be only the *Deadly Nightshade*.

XXX. Among the modern writers upon architectural taste, Mr. Leeds can perhaps be less quarreled with, than most upon the score of

some of his opinions with regard to external forms, *the Pelleterie* of architecture: but it is a sad penalty for a man of ability to pay, a harsh squeezing in the parturition into public notoriety, to join those far gone in architectural shallowness who depreciate a knowledge of masonry and the *intrinsic* means by which have been constructed all the existing *Buildings* upon which could have been formed his taste and theirs: were I to go to him in his old capacity in the book-trade and to deride the structure of his day-book or ledger, or insult his knowledge of the fabrick of different kinds of paper, or to speak flippantly of his knowledge of Pica and Nonpareil, he would perceive immediately the folly and impertinence, and would not scruple to tell me that my idle tongue is active upon a subject which I do not understand. This gentleman himself gives very wholesome advice when he says, "No doubt shallow smatterers, superficial dabblers, half-educated pretenders, ought to be exterminated," and he very properly proposes the effecting of this by superior education to the subject.

XXXI. It is a daring impudence when an example of modern sham architecture is pointed out, for a critic who would willingly destroy the repute of our best edifices, to revert to such an example; for a re-examination of it will prove the depraved want of taste of those who abet such squandering, and their incompetence even to view carefully a fabrication much less to appreciate its excellencies or its defects *.

XXXII. Messrs. Britton and Leeds in the *Illustrations of the Public Buildings of London* give some account of the innovations which have been fallen into in completing Fitzroy Square, but they make no mention of its older parts being done with well-complexioned masonry while the added assumed architecture is only of plaster: the same faulty and almost useless kind of description is too often fallen into; so that if a student peruse such observations, instead of imbibing any real and improving knowledge, he only finds a crowd of fancies and criticisms founded upon mere assumption, and which in the next book which he opens he finds all disputed or annihilated.

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* Mr. Leeds having with some coarseness of diction chosen to go out of his way in his "*Essay on Modern English Architecture*" to comment upon my supposed admiration of the former façade of the College of Surgeons, Lincoln's-Inn-Fields, I here tell him, that in this place as elsewhere, his quotations whether of the sense or words, are not accurate: I have put forth no such sentiment either by word or implication: I admired its Portico as formerly existing: the remainder of the composition as it was without decoration or great dimension, neither excited admiration nor drowned the portico; in this admiration I was not singular by many thousands of persons: the enormity which I wished to depre-

XXXIII. One reason why modern criticisms upon modern Architecture can be rarely relied upon, arises from the circumstance of some of those who compose them being merely writers for subsistence, who are dependent upon their designers for the drawings of the edifices of which they give engravings: after the favors which they have asked of publish-

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cate was the replacing of a front which was *built* for a creaking heap of what Mr. Leeds will be obliged to confess a few years hence, if then alive, to be in his own elegant language "*rubbishly*" enough: of the form of the new design, I have only spoken very incidently as drowning the Portico: if I had wished to pass any critique and condemnation upon the few details of the new work, I might have quoted some of Mr. Leeds's own writings in which similar things are severally condemned: he is himself eloquent enough, when cutting up other works, of the necessity of unity, distribution, and contour: how, therefore, he can find such cause of admiration in an almost detailless front, with its parts so distributed that the piers of its wings are nearly four times as wide next the Portico as at the angles of the building, he can perhaps himself only explain. Mr. Leeds says, "It is not the fate of one building in a thousand to undergo such a *rifacciamento*;" he might have added, prudence and public decency will prevent any other from incurring the like. The use at present in architecture of a little of that which most persons consider to be common sense, which is always to be found in the works of the ancients, joined to their exhibition of first-rate intellect, seems to set a modern self-made architectural critic, into a fit. If I find that St. George's Hospital at Hyde Park Corner, is ruinous and of most questionable taste, when Mr. Leeds takes no trouble to ascertain these facts, it is no doubt not agreeable to him to have his fabric of criticism overset and broken like the fabrication itself, which in acknowledgment of what I have said about its defective structure has lately had its multitude of fractures stopped, though they are already re-appearing. The original design for this hospital had a Portico of circular columns, which was superior to the one adopted, the square columns or pilasters of which seem to excite the admiration of Mr. Leeds, who oddly enough imagines them to be the invention of Mr. Wilkins, whereas they are taken from that store-house for modern corrupt composition in architecture, the Choragic Monument of Thrasyllus at Athens, from which Mr. Wilkins has also taken his abominable façades of three pilasters, some further designs in which depraved style Mr. Leeds has raked out from oblivion and published with the Design of University College, London, the turrets of which it is to be hoped will never be executed as they are represented: twenty years ago a portico of square columns (now lately walled up,) was erected to the Fever Hospital at Battle Bridge, and since then I have little doubt that a thousand others at least have been executed: indeed it seems to embody the bricklayer's primitive idea, for a few piers of bricks plastered over produce this kind of *original* portico. If this critic had asked whether the building were suited to its purpose, and whether it had proper ventilation, he would have given a very different account of it: and if he had forgotten the broken bones and the broken hearts within the fabric, he might perhaps still have observed its eighty broken window-heads.

It is a singular fact, that in so many of our modern hospitals and surgical establishments, where gravity and soundness of building should have prevailed, such a reversal has occurred: one would suppose that it were necessary that broken limbs should be surrounded by broken fabricks: it is thus the subscribers to these fine establishments themselves become patients in pocket. The new buildings of St. Thomas's Hospital are constructed otherwise.

ing copies of those drawings, they cannot be so ungracious as to shew any independence of spirit; for they would lessen the sale of their works, and would embroil themselves with those upon whom they are dependent: but if one is to believe these same critics, folly and rudeness pervade the works of the most famous deceased architects, although the great, the learned, and the scientific of past times, ordered or presided over their erection, or admired them; and though from being *built indeed* they will outlive in fame and real existence, successions of Pantechnicon critics, and many generations of their heirs.

XXXIV. As in this work as well as in the Tract which I lately published denominated "*Hints relative to the construction of Fire-proof buildings, and on the failure to produce sound and estimable Architecture by the means at present usually adopted,*" I have endeavoured to go into the strongest possible condemnation of which I am capable of the depreciating effect of competition in architectural design, upon the structure of buildings and as a necessary consequence upon their taste,—I think it well here to answer such partial objections as have been made to my views: I have met with a great many very sensible and sterling persons, who confirm my own sentiments; and I believe that more than nine tenths of my profession, either openly or secretly, entertain my opinion on the subject: those who think otherwise are mostly very young and shallow in Practical Architecture, or are so near destitution as to catch at the shadow of a straw.

XXXV. In going over the accounts of existing buildings, written by persons who have not professed to give any other than merely a description of their taste and fashion, I find that with very few exceptions these buildings which are commended have been erected without competition; the rest of them I discover to have been obtained by men of eminence whose ability was previously known, and who might have been relied upon without the series of evils which result from competition. An Architect poor or unknown, may need a robe to excite the attention of princes, but instead of assuming a robe of Parker's cement, let him rather like the Architect of Alexandria rush into the presence of a noble patron, clad in a lion's skin: let him be honest, and let his buildings be honest; and before he is starved out, he will find there is no occasion for following the sneaking fradulent pick-pocket system which has led to that extensive Fauntleroyism in Modern Architecture.

XXXVI. Mr. Leeds who in his "Essay on *Modern English Architecture*," sadly misquotes the "Hints, &c.," while he seems to admit fully what I have asserted of the fortunate escape of the science, structure, and taste of St. Paul's Cathedral from the depreciations of competition, intimates that according to my argument abstinence from competition ought to have produced in the case of the new Palace "*an equally fine architectural work*:" Now I have in that Tract stated (§ 35) that "every piece "of excellent architecture in the world, owes its excellence to *a generous* "*reliance upon the acknowledged ability of some learned, tasteful, and* "*scientific individual*; while it is a notorious fact that the most imperfect "edifices have been the result of the most numerous intermeddlers:" therefore as John Nash was acknowledged by no one to be learned or tasteful or scientific, and certainly was not gifted with the whole of those accomplishments, or even with one of them, so necessary to an architect, the just inference should be that he could not produce a piece of excellent architecture of any kind: and Mr. Leeds himself launches out into no slight or ordinary praise of Buildings which are notoriously the result of a procedure the very reverse of a system so seductive to the ignorant, though so poisonous to genuine art.

XXXVII. The only other person whom I have found to differ from me in the views which I entertain upon the subject of competition in architecture is Mr. Lamb, who in the 2nd vol. of the Civil Engineer's and Architect's Journal, (page 213) says, that my assertions are unsupported by any argument with which he can coincide: this he may for the moment fancy to be the case; but the whole tenor of his own observations in that paper, goes in the most forcible manner to continue the proof of what I have asserted; for he himself sneers at the products of competition, he sneers at the tribunals which award the prizes, he alleges that the time allowed is rarely sufficient for the proper formation of proper designs, he casts out no slight inuendoes against the correctness of their estimates, and although he has been successful, I believe more than once, he is as discontented as the least successful, although perhaps the obtaining one such prize, like being drawn once for the militia, is a fair proportion for the whole of a man's life.

XXXVIII. I can never be disabused of the opinion, that all the same causes which operate in the supply of a workhouse by competition, with bad butter cheese and bacon, act and ever will, in the supply of compe-

tition architecture, and will perpetuate the enormous injury, without means can be found for setting competition on a just basis.

XXXIX. If the production of Mr. Barry's Design for the Houses of Parliament be taken as a splendid instance of success, which the least liberal will admit to be the second best design at least, whatever place he may assign to his own, I answer that Mr. Barry's ability and high station in Gothic design were before well known and appreciated, and required no competition to bring them out. What kind of competition might be allowed, who should be the only competitors, and who should be the judges, I have stated in §§ 963-6.

XL. Mr. Lamb asserts, that "*competition in architecture is beneficial to "the public at large, and certainly to the profession :*" he has not however furnished us with a list of instances in which the public has so benefited, although it is very well known that the public has received a great deal of annoyance and some part of it has received much amusement from the subject; and I do not think that any one except *Caninus** would attempt to refute the instances which I have given of the failure in structure of competition architecture.

Certainly Mr. Lamb enumerates as instances of the effects of competition design, two cheap churches, but he has failed to clinch his argument by the information that competition produced the ecclesiastical façade with its pinnacles and other details to be met with in the Bagnigge-wells road.

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* In his *Fasciculus* No. 3. this critic says of himself, "But some folks cry out, "your bark is sometimes downright *barking*. Assuredly; and, after all, one had need have "the three heads of Cerberus himself to bark long enough and loud enough" &c. Think of the dignity of Wren, Jones, or Steinbach, glorying in canine accomplishments, and exchanging their heads of science, taste, and constructive ability for the three brainpans of the infernal porter; abusing everybody and every thing, sneering at that for which all wise men build, viz.—utility, finding fault with every bit of architecture: this cutter right and left without any reforming practical utility, who likes to have all the cutting to himself, after abusing almost every building ancient or modern of which he takes notice, says very sagely (*Fasciculus* No. 6.) that I have not scrupled to affirm that architecture sinks in "quality, science, curious finish and duration:" one would suppose from this want of candor, that the usual misprinting of his name as "*Candidus*" had resulted from the same lapse of truth and the same punishment as stigmatised Gehazi the servant of Elisha, and that perhaps this same miscalled Candidus is a descendant of the man who went out white as snow, and to whose posterity the leprosy was to cleave for ever.

What every respectable Architect who has any real professional business to perform does think of competition, may be gathered from the well-known fact that none such is found to send in a competition design unless he possess or fancy that he possess direct influence for obtaining the prize. I never heard of any one who did not behind the scenes avow this.

XLI. If to be perpetually embroiled with Committees and with the public, and to be sneering at the successful candidates—

If to compete fifty times and gain nothing, or to succeed only with the humiliating feeling of direct influence and the outwitting of others—

If after a life of professional drudgery and success, to die like Francis Goodwin a pauper—

If this unchristian, ungentlemanly, and unprofessional irritation,—if this humiliating partiality,—if this useless labor,—this abject poverty, and this miserable death,—be "certainly a benefit to the profession," from such a profession I would wish to be spared.

XLII. Let him who has the most favourable opinion of architectural competition prove it to have produced, if he can, any superior and scientific ingenuity of plan, any superior beauty of outline, any newness of scientific construction, any discoveries in the design and science of vaults and pinnacles, any strides in the invention and structure of domes, or in any other of the acknowledged elements of beautiful and original architecture.

XLIII. I believe firmly, and every day's experience fixes me more and more firmly in such belief, that these things are of necessity the result of that brown deep study which a man can go into when he is ordered to set to work, and that the superficial drawing of a flurried competition design never did and never will contain a particle of them.

XLIV. In public competition, to canvass the arbiters, to speculate on inexact directions, to strive against the unarchitectural opposition of Terra-di-Sienna and Ultramarine, to fight against the effects of false perspective drawings which exhibit all the beauties and sink all the defects of a design, must be enough to distract from real architectural beauty the attention of most competitors.

Some competitors even believing they have been oft imposed upon in

such competitions, think it a duty to impose themselves as much as possible, by falsity of estimates and shamness of material.

XLV. The ideas which I have ventured to put forth (§ 925-982) relative to the foundation of a National College for the study and regulation of architecture, were in a great measure matured by me about eight years ago; and they were committed to writing almost in their present form four years ago: some months since some imperfect copies of this work having got abroad without my authority, portions of my plan for an architectural college were pirated without acknowledgment, in the prospectus which has been issued for a College of Civil Engineers: the very words in the list of professions, Metallurgy, Mineralogy, Geology, Laws of Property, &c. &c., either exactly or in substance taken from § 967, prove this incontrovertibly; but in further proof of this I have traced to parties closely connected with that embryo institution, the possession of copies of my work in an immature and unpublished condition: I mention this because the proceeding was mean, and because I think that *that* Institution if it ever become athletic will increase still more the severance between Architecture and Engineering, the reunion of which I am laboring to effect.

XLVI. From the great length of time which this work has of necessity been in hand, there has been a considerable increase of architectural literature since the first pages of it were printed; several works mentioned by me to be in progress are now completed, and several new practical works are now in course of publication: they are all well known to the profession: among them, Mr. Cresy's Treatise upon Bridge-building (the text of which is not yet issued) is one of the most splendid: its delineations of modern works of high rank whether for external beauty or for construction, and above all, its delicately delineated sections of ecclesiastical edifices, render it a work in value beyond sterling price; for delineations of things existing will often teach theory more readily and more lastingly, than the most deeply skilled verbal elaboration. The other treatise upon the same subject by Messrs. Hann and Hosking, is also a very valuable work, in a cheaper form. Another series of works promising to be of high interest to all architectural practitioners, is Mr. Billings's continuation of Britton's Cathedral Antiquities, of which 2 Parts of the Work on Carlisle Cathedral are already published: these in their Engravings are cheaper than Britton's Work, but while less burthensome in cost, are more copious in number of illustrations, which are strictly of a practical nature.

It is also proper to notice that a 2nd. Volume of the Transactions of the Civil Engineers is published—and that additions of more recently erected edifices have been made to Pugin's Public Buildings of London.

But one of the most useful augmentations to the Literature of Practical Architecture is Smith's translation of Vicat's Treatise on Calcareous Cements, with additions, explanatory notes, and accounts of new experiments.

To render this Work more complete and useful, an addition is made to it of the contents of the Metropolitan Building-act arranged alphabetically, and with references to some other Acts of Parliament which bear upon the subject. The rudiments of this abstract were made about the year 1820.

A. B.

Warwick House, Gray's Inn,
Dec. 1839.

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METROPOLITAN BUILDING-ACT, arranged alphabetically, with references to other acts.

GENERAL INDEX to the whole of the work.

PART I.

AN ESSAY ON THE DECLINE OF
EXCELLENCE IN THE STRUCTURE AND IN THE SCIENCE OF MODERN ENGLISH BUILDINGS;
WITH THE PROPOSAL OF REMEDIES FOR THOSE DEFECTS.

"What" "Bath will become in a few years" "may be easily conceived." "These new mansions" are "built so slight, with the soft crumbling stone found in this neighbourhood, that I should never sleep quietly in one of them, when it blowed (as the sailors say) a cap full of wind: and I am persuaded, that my hind Roger Williams, or any man of equal strength, would be able to push his foot through the strongest part of their walls, without any great exertion of his muscles."—HUMPHREY CLINKER.

"Benche alcuni Architettori in diuersi luoghi d'Italia han fatte alcune fabriche di muro semplice, lasciandoui i luoghi delle pietre uiue, & da li ad un tempo, poi ci han posto li suoi ornamenti: tuttauia per non esser tai cose ben legate ne' muri: ma quasi attaccate con la colla; si uede in molti luoghi esser caduti de' pezzi, & ogni giorno minacciar ruina."—SERLIO, lib. iv. cap. 9.

והוא בנה הדיר החכם מודים אתו ותמל

EZEKIEL, cap. xiii. ver. 10.

[redacted]

"It is by due Consideration of the Statick Principles, and the right Posing of the Weights of the Butments to the Arches, that good Architecture depends; and the Butments ought to have equal Gravity on both sides."—SIR C. WREN. *Parentalia*, p. 298.

"The principles of masonry, and not of carpentry, should be seen in our architecture, if we would have it according to the rules of just taste. Now we affirm that this is the characteristic feature of what is called the Gothic Architecture. In this no dependence is had on the transverse strength of stone. No lintels are to be seen; no extravagant projections. EVERY STONE IS PRESSED TO ITS NEIGHBOURS, AND NONE IS EXPOSED TO A TRANSVERSE STRAIN. The Greeks were enabled to execute their colossal buildings only by using immense blocks of the hardest materials. The Norman mason could raise a building to the skies without using a stone which a labourer could not carry to the top on his back. *Their architects studied the principles of equilibrium*, and, having attained a wonderful knowledge of it, they indulged themselves in exhibiting remarkable instances. We call this false taste, and say that the appearance of insecurity is the greatest fault. But this is owing to our habits; our thoughts may be said to run in a wooden train."—DR. ROBISON'S *System of Mechanical Philosophy*.

"L'art de bâtir consiste dans une heureuse application des sciences exactes aux propriétés de la Matière. *La construction devient un art, lorsque les connaissances de la théorie unies à celles de la pratique président également à toutes ces opérations.* ON APPELLE THÉORIE LA RÉSULTAT DE L'EXPÉRIENCE ET DU RAISONNEMENT, FONDÉ SUR LES PRINCIPES DE MATHÉMATIQUE ET DE PHYSIQUE APPLIQUÉS AUX DIFFÉRENTES COMBINAISONS DE L'ART."—J. RONDELET'S *Art de Bâtir*.

והאנשים עשים באמונה בטלאכה ועליהם

2nd CHRON. cap. XXXIV verse 12.

PART THE FIRST.

CHAPTER I.

The Author's Motives for putting forth the present Work.

1. In venturing to put forth the present work, the result of no small or careless labor, the author cannot pass the opportunity, of explaining his reasons for engaging in such an undertaking.

2. In a practical experience of twenty years, and of consequently increasing information, the author has observed, that no other branch of the architectural or building art, is so much neglected, as the giving a correct comprehensive and clear description, of any intended Architectural work.

3. The scientific press of Britain, has indeed of late years, teemed in an extraordinary manner, with the most magnificent, laborious, valuable, and interesting works, upon the *decorative* part of architecture, so as to call forth the admiration and gratitude, not only of architects and amateurs, but of the whole nation, and even of the world at large,—while indeed, it has produced, very little in the real scientific constructive and practical departments of the art of building; and the Author knows of no previously published work, devoted to the same subject.

4. In collecting and arranging, so extensive a body of practical observations and directions,—in noticing the abuses in an art, noble and benevolent, and one in which the best men of the best times have ever taken delight,—the Author trusts that he is the humble harbinger, of close professional attention to this important subject; and, from his thus drawing, public as well as professional attention, to the causes of the failures in the modern buildings of the wealthiest and most powerful nation of the globe; and by his shewing from what sources have sprung, the present depressed state of English Architecture, and the public outcry against it; he trusts also that he is making one step upwards in the revival of practical art, the ascent to which, will be followed by the scientific, who have not only discernment to know our fallen state, but courage and patience to reach the summit of that art, which he is sure, none ever really studied without feeling for it a thirsting fondness.

5. The present work, must of necessity be very imperfect from the circumstance, of there not being previously in existence, any other work upon which this could be grounded: and although, for the choice of the materials of it, the Author has ranged over the accumulated professional papers of twenty years, he does not pretend, labored as his work is, that it can be other than an useful commencement, of something which time and still more pains-taking professors, shall hereafter further develop. There have been put forth, it is true, a few detached specifications; but these, have mostly been appended, to designs for buildings, the work of the young professor at an age when he has acquired no practical experience; for very few experienced architects, have either time or inclination for the publication of designs, and some at mature age, have even bought up, the impressions of those works, which they put forth in comparative youth, and after they have discovered, that they hold the title of *Chief Constructor*, for a purpose, other than the discovery, of how mean and flimsy, the materials and construction of an edifice may be.

CHAPTER II.

Of those for whom this Work is not intended.

6. THERE are *two classes* of persons for whom this work is not intended :—the first, consists of those, who by a long course of research and practical devotion to the subject, have formed better conclusions of their own ; and who by their own industry and knowledge, have acquired a more methodical and pains-taking mode of doing their work : the second class, consists of those, who by nature cannot, or will not, seek to develop the niceties of their art ; and who from incompetence or inattention, can neither appreciate method and exactness in others, nor follow either of them themselves. From the first class, in humility, the author would learn every thing by which he could improve his work ; from the faults of the latter class, he would wish it, if possible, altogether purged.

7. There is yet *another class*, for which this work is not intended, viz. those who fear to lay before their employers, at one view, a correct statement of all the particulars of a contemplated work, lest those employers, frightened at the extent of them, and at the amount of the estimate of the probable outlay, should either, altogether lay aside the design of building, or else spoil every part of the work by improper erasures, and if the professional man, should either decline to carry into execution so bad a project, or shew unbendingness in any part of the matter, will find some other person, destitute perhaps of constructive knowledge, and less honest, but more complying.

CHAPTER III.

Of the Exactness requisite in the practical Profession of Architecture, and how far it is influenced by the Correctness of Specifications and Working-drawings.

8. THE whole course of practical architecture, requires in all its details, the most minute and indefatigable exactness of execution : the architect can, therefore plead ill, for want of method and exactness in the measures which it is his business to take, for the proper direction of the artificers who are to act in pursuance of his mandates ; and hardly can he with any grace, call to account those under him, who have probably acted with more precision than himself.

9. While from the vast influx, of young professors to the building art, there are now almost more professors than buildings—to execute, it is to be lamented, that out of that number, so many have not received the benefit, of an education, so liberal as is required by an art needing such a fund of literary as well as practical knowledge. Without a critical knowledge of the nature of the words, it is impossible that the practical architect, can in a specification to be put into the builder's hands, so describe and so define his intentions that they can be executed. The author has seen many specifications, which besides having their sentences grossly ill constructed, and ungrammatical, were otherwise so obscure in their phraseology, as to render it impossible to understand clearly the intentions of the writers of them.

10. It may be set as the glory of an architect's specification, that it shall be so clear, that the builders who from it are estimating the probable cost of the intended work, may have to ask no questions ; that the specification, shall contain an exact comprehensive and proper description of the work, as it really can be, and as it *ought* to be executed ; omitting nothing whatever, which the architect's practical knowledge experience and foresight, may tell him, must be included in the work ; that the words of it, shall be so chosen, and be so arranged, that there shall not be the shadow of a doubt or ambiguity in any part of it ; and that the

whole of the intended work, shall be completed, without extra charge for things negligently omitted, and without the possibility of a dispute upon the construction of any of the words of the specification.

11. The architect has frequently, to take to himself the unpleasant reflection, that a want of accuracy in the execution of his work, is more his own fault than that of the operators, from his drawings and specifications not being made with precision sufficient to insure exactness of execution. With every possible care, accidental mistakes will still occur; and whoever has busied himself in the admeasurement of existing buildings, well knows, how very few of them, will in this respect bear the test of actual admeasurement. It is not sufficient for him to trust to the Clerk-of-the-works, or to his own clerk (unless the clerk be the real architect), or to the foreman of the works; if the architect, will not himself take the trouble to examine the dimensions of the work, while the foundation of it is being laid, and constantly from time to time afterwards, he may be certain of finding, to his annoyance, some mistake or other, which will greatly trouble him, and that perhaps in some prominent decorative part of the work.

CHAPTER IV.

Of the Disputes and Expenses which arise from badly drawn Specifications.

12. Almost solely from sufficient pains not being taken in drawing the specifications for buildings, and from a want of proper foresight, may be traced, most of the disputes between the builder the architect and the employer, which so often occur, and which lead to lawsuits and arbitrations, which are oft-times so excessively and even ruinously expensive, and though final are unsatisfactory to all parties.

13. The turn of a phrase, the situation of a single word, the causing or the avoidance of a possible ambiguity, may sometimes involve the question of many hundreds and of even many thousands of pounds; while it ought to be the duty of the professional man, to take care that when a contract is entered into, no disappointment may ever occur, as to how much work the builder has to perform, and how much money the employer shall have to pay for that work.

14. Indeed, oft-times it is only owing, to the circumstance of the contractor for the execution of a building not having himself sufficient education, that he does not detect the loop-holes which a man of education, who possesses the requisite technical knowledge, frequently can discover in a badly drawn specification.

CHAPTER V.

Of the Trouble and Vexation, which an Architect occasions to himself by a badly drawn Specification; and on the Propriety of General Clauses in Specifications.

15. Indeed, sometimes a careless or incompetent professional man, knowing the flimsy nature of the *specific* part of his *specification*, will intrench himself, behind a host of strong general clauses, which indeed assert, that the work must be finished in some way or other to his satisfaction: but if such a professor, would only reckon the time occupied in disputes; the trouble to himself, in from time to time discovering what were his real intentions, if they were indeed ever developed to himself; and in giving the subsequent explanations, as well verbal as written—he will find, that the saving of a little time and pains in the first instance, will in the end, cause him an infinitude of extra trouble; in addition to which, if an irritable man, he will be kept in a constant state of feverish

excitement with the builder, he will have many ungentlemanly disputes with him; and the builder, thinking himself injured, will probably involve the whole matter in a law-suit. Nor are there wanting many cases in which the architect, through such carelessness, has lost a valued patron's employment.

16. Except for the mere *manner* of the work, the author can hardly think strong general clauses just; and he now never inserts them, unless he has previously included in the *particular description*, every thing which he believes the building can require: indeed he cannot think it borders upon honesty, to involve perhaps in bankruptcy, the builder, who like all laborers is worthy of his hire, by rendering him, ignorantly liable to perform to the detriment of his family and his creditors, and to the scandal of society, that work, of the nature of which, at the time of the signing of the contract, the architect himself has not had a clear idea.

CHAPTER VI.

Of Marginal References in Specifications and Contracts, their Convenience, and their Tendency to insure the correct Performance of the Work; and of the Care with which Specifications should be copied in Contracts.

17. Above all, it is to be recommended, that every specification have added to it, a complete set of marginal references: the adding of these, will cause the architect no extra trouble, if done while he is composing the work; they will rather serve him as an amusement, as he is preparing his mind to go into some other part of his labor; or if any thing cross his mind, which he knows must be inserted in some other part of the specification, he can place the name of the subject *forward* in the margin, so as to insert the particular matter in its proper place, and thus not forget, that which perhaps it may be of the highest importance should not be forgotten: indeed, in addition to the above mode of helping his memory, the author has always at his side while composing a specification, a slip of paper, upon which he writes a list of all such things as occur to him out of place, but which he might otherwise not remember in place; and after the draft appears otherwise complete, he reviews the whole of it, and if any thing in the memorandum should be found omitted in the specification, he then inserts it. By this means he very rarely finds any thing forgotten; and without his having to overstrain his words, which an honest conscientious man would think unjust, he finds the contractors in general cheerfully complete their work, without observation, and without asking for any amplification or extra payment.

18. Without marginal notes, the architect cannot himself readily turn to such particular parts of the specification as he may require to read or to explain; and in addition to that inconvenience, he will often find, that neither the Clerk-of-the-works, nor his own clerk, has found the particular material directions till after the work is performed, and then it will be too late to make the requisite amendment, either from time not permitting, or from the utter impossibility of doing so without a re-construction of the whole building.

19. In one thing the architect must not spare his pains: if the contract be drawn up by an attorney, it is absolutely requisite, that the architect should very diligently read over examine and correct the copy of his specification, as inserted in the contract, otherwise he will afterwards find to his great mortification, that it contains, many of the most strange and oft-times ludicrous errors, which the copyist, from the want of the requisite technical knowledge, will not have previously corrected: and it will be well, if the architect insist, that the marginal references of the specification, be inserted in the contract, otherwise it will be so burthensome to refer to, that it will be laid aside during all the progress of the work, but produced and read over at last, the business will terminate in a general misunderstanding and mutual accusation.

CHAPTER IX.

CHAPTER VII.

Of the Advantages which would result, if Copies of the Working-drawings and Specifications for all Public Works, were deposited somewhere for public and private reference.

20. It would tend greatly to the acquisition of general practical architectural knowledge, if by act of parliament, copies of all the working-drawings and specifications for the building of all churches and other public works were deposited in the British Museum, or some other place rendered fire-proof, for public access and examination: this would prove of infinite use, also to those architects who might afterwards have to repair or restore public buildings; and it would besides insure strict integrity, in the carrying on of every part of the work, from the fear of detection in case of scrutiny; it would tend to purge the profession from all incompetent and dishonorable practitioners, from the fear of exposure of ignorance or dishonesty by such public documents; and it would enable the scientific man to possess printed copies of all important and valuable documents, relative to executed works.

CHAPTER VIII.

Of the evil and depressing Influence which bad Building has upon Architecture.

21. The injury of bad building, is not confined to itself, but by the influence of evil example, effects the total ruin of a once-noble art. Proprietors, for the most part, unable to discriminate between good, and bad building,—between correct, and imperfect architecture,—between confusion of style, and purity,—between durable and profitable materials, and those the reverse,—between sound and wise construction, and reckless mal-formation,—between the secrets of mathematical tie and equipoise, and thrust,—and between seeming economy, and practical economy; influenced by false appearances, believing the stability and propriety of all that is sanctioned by *a professor*, they are sometimes ready to give into all that is practically extravagant, absurd, and disastrous; and frequently the more clever they are upon ordinary subjects, the more rash are they in practical architecture, from not considering sufficiently the duration of different materials, their toughness, strength, stiffness, and weight, or the exposure to which they may be subjected.

CHAPTER IX.

Of the Influence which Contracting for the Erection of Buildings has upon Architecture.

22. As if modern buildings were not designed slightly enough, as if the spirit for good building were not otherwise sufficiently depressed, as if the quantity of science employed in English architecture were not sufficiently low, to the other evils is added in an eminent degree, that of bad execution in an enormous number of cases; and this results almost entirely from the work being performed by contract.

23. It is not that a contract, ought to insure or does insure, the bad execution of the work; but the party with whom the contract is made, may and does in many instances so insure it. Formerly, many of the noblest and most intricate works were executed by contract: the astonishing stone roofs of King's College Chapel at Cambridge, and Saint George's Chapel at Windsor were so performed; they were "*workmanly wrought made and sette up after the best*

"*handlynge and forme of good workmanship, according to a plat thereof made and* "*signed,*" the contractors agreeing that they "*shall provide and fynd at their* "*costs and charges as moche good sufficient kable ston,*" "*with lyme, sand, scaffolding,* "*cinctores, moles, ordinaunces, &c.*" as should be necessary. But then a contractor who would *deal faithfully* was found, and was employed *because he would so deal*, and *deal so he did*, and his work is become a proverb in the land; at home and abroad, the Englishman is proud of it; he likes to possess delineations of it; and were it by any accident destroyed, he would be uneasy till a restoration of it were attempted.

24. A contractor is not *now* employed because he is known to be a skilful and a faithful man; a public advertisement is put forth, and except in such undertakings as are only within the ability of a very few large capitalists, this acts as a warning to most solvent and trustworthy tradesmen to keep aloof, while it acts as a call to the needy, the broken-down, the incompetent, and the dishonest.

25. Though frequently the employers and trustees, are merchants or tradesmen, or are acquainted with mercantile pursuits, and know that a needy man without capital or credit buys dearly, though they know that embarrassment destroys the ability to execute, still is the broken-down or the fraudulent entrusted with the execution of a great work; he brings a ramification of sureties of his own kind; his creditors are eventually defrauded; and though the work, may have cost somebody much more than the amount of the consideration of the contract, still the materials and workmanship, are generally of such a description as to bring a real loss to the proprietors, and to mortify and make them ashamed. Public committees are fond of punishing public contractors; but they forget, that in inviting such men, they assist them in their frauds. All public committees, should consider that they are in some sort a branch of their country's police, and that fraud is better prevented by discouraging it, than by punishing it.

CHAPTER X.

Of Sureties to a Contract.

26. It is certain, that almost all well-executed work, has been done either without contract, or by contract without sureties; while it is equally certain, that nearly all work badly executed by contract, has been performed with the safeguard of sureties.

27. It may be taken as a general rule, that if a man cannot perform work excellently without them, neither contract nor suretiship will compel him to do so; he may perform something, but he will not execute the spirit of the contract.

28. If a man need security, he ought not to be entrusted; and yet even public committees, are sometimes so eager to secure the bait of a low tender, that they have instantly required the signature of a conditional agreement, to subsist while the contract is being prepared; yet have found the very next day, the character of the contractor is such as should be avoided.

29. How virtuous is the advice of Solomon against suretiship: it may at first seem hard, that an honest man should not obtain it from his dearest friend; but were not the present artificial system in use, no surety would be required of such a man; and should unforeseen misfortune overtake honest integrity, the consequent default would fall lightly, and would fall seldom: but at present, the most vicious and least trustworthy, is employed, because he brings the guarantee, of those relations whom he has already half-ruined by his recklessness or his fraud, but whose nearness of kin, forbids their refusing him that suretiship which they know from experience will be forfeited. Thus suretiship, which is intended

to prevent fraud, is the most powerful engine of fraud and ruin; while it puts from employment, the honest man, who either cannot or will not obtain it. If only men of character were employed on public works, rarely would guarantees be found requisite; and even in public contracts, if such a failure did take place, the public could better make good such an occasional default, than relations, who have frequently to re-establish in life the unfortunate.

CHAPTER XI.

Of the present State of Architectural Mechanical Knowledge.

30. Perhaps at no age of the world, was there ever such an abundance, of practical and theoretical mechanical knowledge, applicable to architecture, within the reach of every one, as at present: we know how to truss roofs floors and other members of buildings, so as in the most wonderful manner to save materials, and afford greater strength and security than could be obtained from solid beams, while we can save the expense and weight of solidity; we know how to build vaults nearly as well as did the architects of the mid-ages; we have more experience than our forefathers, in the chemical properties of materials, and in their actual duration; we know more of geometry and calculation than they; and our abundance of capital, and our navigation and roads, enable us to procure from any distance, the rarest materials, at prices which compared with those paid by our ancestors are really very low; while in the workmanship of all but carving, which requires the slow operation of the human hand, and the distinct operations of the human mind, our machinery, can be made to perform that in a minute, which took our ancestors a whole day to execute.

CHAPTER XII.

Of the Improvements in the Operative Machinery which may be adopted in Building.

31. Our forefathers performed with excellence, almost every thing which they undertook; but it was by constant laborious and painful exertion. The triumphs of modern mechanical science, have now rendered unnecessary, in a great measure, that painful bodily exertion: we have *now*, mechanical powers, which render the quarrying of huge and magnificent masses of stone an easy labor; the steam-engine, can be applied to effect the most extraordinary feats of exertion; we have powers, which have raised an enormous ship; and we have the advantages of such roads, canals, and seaward navigation, as no country at any former period ever possessed; and besides these ways for bringing materials, we have many railroads, and we shall shortly have many more.

CHAPTER XIII.

Of the excellence of the Materials, which the English Architect may have in modern times at his disposal.

32. Since the improvements in rail-roads and navigation, we may have at our easy disposal, and at a cheap price, the magnificent produce of the quarries of granite; we have an abundant supply from the Isle of Portland, of the most compact, white, hard, beautiful, and durable free stone, that perhaps earth can produce; and besides inexhaustible stores of iron and lead, we have such an

improvement in the making and burning of bricks, that they are sometimes, and always may be, more durable than those of any former period, and even more durable than most kinds of stone; we have inexhaustible stores of stone-lime, which in two or three years becomes scarcely penetrable; our ports may be inundated, as it were, with durable fir of the most splendid growth; and from the great way which English capital will go, when expended in other and poorer countries, we can procure cheaply all the beautiful and rare materials produced by foreign nations; and from the constant vast influx of the precious metals from the mines of America, money compared with labour and general produce has become cheap, not those articles become dear, for they are *comparatively* cheaper than ever; we can *now* buy for our edifices, lead, iron, copper, brass, bronze, silver, and gilding, at real intrinsic prices which would have astonished our forefathers.

CHAPTER XIV.

Of the question "Have we improved in our PRACTICAL building?"

33. With all our advantages, have we improved in our practical building? The short answer, is No. Under the fostering influence of our Royal Academy, Painting and Sculpture, have made rapid strides; the benevolent art of engraving, brings home to every man's house, stores of knowledge and beauty which were formerly unpurchaseable.

Mechanical power, and mechanical knowledge, have advanced in thirty years more than they advanced in three thousand years before; we know how to build, in most cases, with as much skill as our forefathers, and in some with an infinite deal more skill; we can procure and raise such excellent materials as our ancestors hardly ever could; our money will go further in purchasing magnificent foreign materials for the adornment of our edifices; we can cover them with gilding with as much ease as they could cover them with paint; for every cramp of iron which they put, we can put one of bronze, and even almost of silver; capital can be found at an hour's notice, sufficient to finish a building, the funds for which, could not formerly be collected under a hundred years; and yet with heart-breaking shame, almost every modern English architect is obliged to admit, that he does nothing of which he may be proud; from the use of mean and rapidly decaying materials, from marred design, from false appearances, we are obliged to confess ourselves rather a Society of English Plasterers, than of English Architects.

CHAPTER XV.

Of the bad modern National Policy of Discouraging Public Works and Useful Arts.

34. At a time when English territory was contracted and poor, at a time when much of English money was expended both in domestic as well as foreign war, at a time when papal demands drew off its gold to Italy, at a time when its population was scanty and its lands were ill-cultivated, every part of its extent, was at once being gemmed over with the most beautiful churches, cathedrals, monasteries, halls, castles, colleges, and other beautiful public as well as private works. This enormous accumulation of excellence, which, after the havock which time and human fury have exercised against it, still forms, next to the works and gifts of nature, its proudest merit; this accumulation of wise science and beauty, employed the children of the soil, but left no national debt; no debt, other than the debt of gratitude and esteem, has been left to the nation, by those who built the cathedrals of Salisbury, Wells, London, and of our other cities.

CHAPTER XVI.

35. But now that England is mighty all over the earth; now that by her political influence and her powerful domestic machinery, she is almost ruining and under-selling all the world, and would quite ruin many of her neighbours, were it not for the counterpoise of her national debt; while gold flows into her coffers from all nations, and she has become the usurer of the world,—now is her land fallen to meanness; the costly beauties of her soil are the crumbling wrecks of former times; and with little exception beyond the mere means of access—roads, bridges, canals—all is poverty-struck and expiring.

36. Surely in this there is great national mistake. The employment of a population *eager for employment*, does not impoverish a land, it enriches it: the growth of nature, is but an ordained and necessary re-combination of nature's atoms; but the work of the laborer is a new creation; to draw from the quarry a block of stone, and to chisel it into beauty, wastes not one grain of gold, but circulates it: were our half-employed population, who must live, and who do live, employed to their full powers in beautifying the land with useful and tasteful works, nothing that we now possess (except idleness) would be lost; while the beautiful aggregate result of labor would be wholly gained: nay, there can be little doubt, that were our poor-rates paid to our destitute poor, and to their fathers sons brothers and other relations, for the performance of useful public works, a more independent, a more moral, and a better substitute, would be found for cherishing the destitute and unfortunate; and, by the beautifying of the land, the rich foreigner would to our profit come from afar to view its wonders; the money paid every year, to the idle able-bodied poor, would every year produce under skilful guidance, one or two such national buildings as Wells Cathedral, which is more like the work of enchantment than human labor: the money paid every year to the idle poor of a large parish, is sufficient to rebuild the parish church, and might so rebuild it, and keep most of the paupers from destitution, if paid to them and their relations for labor performed: how wise is the old principle, that the overseer *shall* find employment for the poor; such employment, would in fifteen years, entirely rebuild of granite and Portland stone, all those cathedrals which have been three hundred years decaying; and all our decayed public buildings, would be rebuilt in a superb and durable manner, in an incredibly short time. Many parishes could, without extra charge, keep three or four hundred laborers constantly employed on public works. Hence the money laid out in public railroads, is all gain to the nation, without one penny loss; for no money is annihilated; but iron and stone are dug up, ground is removed, clay is moulded into bricks, while no gold and silver are lost destroyed or hoarded up; and perhaps it is not going too far, to believe, that the surplus idleness of this country, properly awakened to activity, might by means of rail-roads and other improved communications, cover over with fruitful soil and bring into culture, most of the present barren tracts.

CHAPTER XVI.

Of some Laws which tend to the still further Depression of English Practical Architecture.

37. While the general principle of the British laws is wisdom, soundness, and equality, it seems strange, that among the other causes, which have in the nineteenth century, conspired to ruin our practical architecture, are some singularly foolish laws, the repeal of which it is to be trusted will ere long be the forerunner of a revival of practical excellence in building.

38. Formerly we had a plentiful store of English oak, for all purposes of domestic carpentry; much of this still remains in our ancient buildings, and it seems rather seasoned than impaired by time: our glorious ship-building, has now rendered the employment of fine timber of this description, and of ample

growth, rather rare with us ; still, we could obtain from the Baltic, on very cheap terms, noble fir timber, inferior only to oak, and for its squareness length straightness of grain stiffness and kindly nature even superior to it. The Author will yield to no man, in love for his country, its church, its constitution, and its other institutions, yet he must confess that, for the favor of an ungrateful colony, he thinks it hard, that timber fit for little else but fire-wood, should be brought here protected by a very low duty ; while the magnificent excellent and faultless timber from the Baltic, which could be imported at much the cheaper rate, should be disparaged by a very high duty.

39. This political folly, fills every peer's and every commoner's dwelling, with the dry-rot ; it disparages every man's freehold ; it injures every leaseholder ; it every moment, adds one more popular jeer, to the outcry against the modern building-art ; and it every day adds strength to the praise of "*the good old buildings.*" Without going into all the bearings of the question of "*free trade,*" surely, if in any case an *ad valorem* duty be judicious, it would be so upon foreign timber ; Canadian timber, would not then of necessity be proscribed of every good architect ; it would not then be fraudulently shaped like Baltic timber, and be covertly used, to the exclusion of its cheaper and better competitor.*

40. Another law has a very bad effect upon architecture ; this is that by which a duty is imposed upon insurance from damage by fire : every thing which renders the safety of property dubious, depresses architecture, both as an useful art, and as a fine art : caution refuses outlay upon that which is ill-protected.

41. The tax upon insurance, is unequal, and in a great measure defeats itself. A payment of 1s. 6d. per annum for every 100*l.* is found to cover the risk of damage by fire, in ordinary cases ; and moreover sufficient to pay the directors, secretary, surveyor, and clerks, and to defray the rent, agency, and other outgoings of a fire assurance establishment, and even to afford some profit besides : now for the privilege of being prudent, the subject has to pay 200*l.* per cent. above the risk, and for the assurance of those very materials, for which he has previously paid large duties ; while some extensive and prudent freeholders, wholly escape this second tax ; for if they possess houses enough, scattered in different situations, the 1s. 6d. per 100*l.* will cover the annual risk of their property, and they will altogether save the duty of 3s. per cent. The Author knows some, who have for years benefited by this close prudence.

42. The consequence of this very heavy and injudicious tax, is that house-property and buildings generally, are rendered insecure ; many go uninsured, to the frequent ruin of small proprietors ; and in general buildings are very inefficiently secured against loss by fire. The imposition of this tax is one of those cases in which the nation gnaws its own vitals.

43. It is not to be advised, that the duty be taken from the insurance of buildings of a hazardous nature ; such buildings are a public nuisance, and the higher the expense of maintaining them, the sooner will such a combustible and dangerous mode of construction be abandoned.

44. It is not the Author's intention, to join in the too-common outcry against the Metropolitan Building-act, which indeed needs some revision, partly from practical errors discovered in it, but which though it be an act of a somewhat stern and interfering nature, is in the hands of wise and honorable district surveyors, truly of a benevolent character, and has perhaps saved more lives and property than almost any other legislative enactment whatsoever.

* This was written before the Canadian rebellion.

[redacted]

CHAPTER XVIII.

CHAPTER XVII.

Of Defects in Buildings, resulting from Professors of Architecture practising before they have acquired sufficient Knowledge.

45. Taken from school, at an age in which he cannot have imbibed in any degree sufficient of a polite and liberal education, the architectural pupil, frequently with no knowledge whatever of geometry, never acquires any beyond the mere manual dexterity of drawing circular and plain lines; abandoned by his master while yet scarcely arrived at manhood, forced into premature and profitless practice with all the expenses of a separate establishment, it cannot be wondered at, that the adolescent architect sometimes has, in after-life, bitter cause to repent the circumstances and the rashness, which led him to acquire practical design and practical construction, solely by his youthful failures; for it is then with deep repentance, that he perceives the confusion of styles into which he has fallen, the whole chronology of gothic arches which he has paraded in the same façade, the mixture of Roman forms and luxury with the severe and elegant simplicity of the Greeks; in many a breaking-up and fracture, he has the mortification to find that inventions upon which he has relied for eternal duration have not survived their inventor's ruin; that he has formed his pinnacles with graduated outlines as if Rosslyn chapel or some other impure source were his only pursuit; he regrets that he has placed his columns opposite apertures, instead of opposite piers; he regrets that from false bearing, want of plumb and equipoise, his work is so fractured, that even a man of more experience than himself cannot restore it; he perceives too late, that his patronage of mean and fragile stone and pretended substitutes for it, his reliance on bad timber, has added something to the wreck of his country's architecture; he perceives with deep mortification, that his want of mathematical and mechanical skill, both theoretical and practical, has led him to perform that which a professor of more experience would avoid; broken arches, tie-less roofs, walls thrust from their right position, partitions falsely trussed and groaning beneath loads which formed otherwise they might have borne unflinchingly, and a foundation which fails in all directions from want of sufficient spread to the footings or from the building being carried up piecemeal, or from other causes—these are a few of the faults and disasters, which in after times, make a precocious practitioner, wish he had studied five or ten years more, before he had risked himself and his employer's property.

CHAPTER XVIII.

Of the Injury resulting to Practical Architecture, from the Advertising for Designs in Competition; of the Quarrels to which it leads; and the general lowering of Architects and their Works thereby.

46. One of the great causes of the decline of science in building, is the modern practice of advertising for designs. When Charles the First of England set about the erection of the palace of Whitehall, did he advertise for plans, &c. for the structure? No, if he had, probably he would have set about a work, as grand, as unique, as well erected, as some of the modern gems of architectural art, built from competition designs. The same fate would have attended the Cathedral of Saint Paul, London, if by misfortune its design had been selected in any such manner, from the contributions of the forward, the inexperienced, or the needy, who frequently answer the advertisements, of those who wishing to benefit by the talent of professional men are still unwilling to pay for it, who, because they want *one* design, raise the hopes of a hundred or more of

such men, and for one paltry work, obtain a combination of professional labor, of which even the bare copying would employ one individual years and years of that time which ought to be blessed and valuable, and which, if paid for properly, would cost more than the gross outlay allowed for the building itself; and when the choice is made, the competitors often have the mortification to find that the building erected from the chosen design, is ill-constructed, and exhibits every mark of a vulgar and common mind.

47. If a man call for physicians or lawyers, he pays them honorably and handsomely: they do not come in a body, and bring a hundred or more prescriptions or deeds, made on speculation for his particular case, and of no value for any other, for him to choose by his volition perhaps the very worst, and leave the others unpaid for. No, a doctor, a proctor, or an attorney, who should solicit and ply thus, would be considered to be degrading his profession; but alas for degraded architecture!

48. The Author, has not the slightest wish to disparage the talents and taste of those gifted patrons, who among their other pursuits, have made architecture their study; to such patrons, we look for the up-raising of architecture from its present abasement; were it not for the providential sustenance to be derived from them, we might every hour expect the poor superannuated science, to be gasping in the very *article of death*.

49. We have now combination of talent; and we have, it is said, free choice of designs; and yet more and more, does the public outcry rise against modern English architecture. How is this? What does competition do? Has it raised architecture? no. Has it depressed it? yes. How so?

50. It must be granted, that they who wish for designs, wish for something which they cannot make themselves: they have designs; if they have not studied sufficiently to form beautiful designs themselves, are they aware of the corruptions which may be introduced into a design? are they certain that the construction is good? can they say whether the estimate is correct? To be certain on these points, they must have at least as much knowledge as he who made the design, or rather more; and in such case, they would need no assistance: *in the majority of cases, disappointment proves that in the choice, these considerations have not had their due weight.*

51. At the present day, he who will produce a flaunting drawing, shaded and colored to represent a building of masonry, although really intended to be a miserable outwardly-bedaubed pile of soft shattered bricks; he who will in this manner deceive the uninformed, he who will put forth the least correct account of the probable ultimate cost,—will pass for the most talented architect: his ephemeral finery, will pass for taste and cleverness; his miserable scantily-constructed walls floors and roofs, will pass for inventive judicious economy of material; and his unfaithful estimates will pass for conscientious strictness.

52. One of the greatest of all grievances connected with architectural competition, is the affected sealed secrecy in the choice: whoever knows any thing of mankind and of life, knows that however honorable are the intentions of the umpires, this sealed secrecy cannot be maintained: it is utterly impossible, but that the umpires must know some practitioner, who from friendship, or by other means, obtains more information than strangers, of the requisites of the design, and of the taste, opinions, and feeling of the umpires themselves: it rarely happens, but that one at least of the umpires, is at the very time employing some professional man, whom he *does* employ because he esteems his talents and his conduct; and whom he greatly desires, to be entrusted with the intended work: all this is, so far, as it should be: but then with this pre-conceived respect and bias, there should not be the affectation of sealed secrecy; other men should not be put in commotion, for an useless struggle; it is *that* which is dishonourable; and it may be confidently asserted, that even though such an umpire, earnestly wished to remain uninformed, of the style of architecture, the

mode of drawing, the motto, the rebus, the crest, and the hand-writing of his protégé, it would be almost impossible for such secrecy to be implicitly maintained :—hence, if there be competition at all, it ought to be open, without concealment of names; for the present method, produces an effect the very reverse of that which is intended, and always to the discredit and lowering of our profession, ends in something like a brawl or disgusting quarrel. From these circumstances, the day is not far distant, when the engaging in public indiscriminate architectural competition, will be taken as the mark of a low professional practice. Others can sell their rejected wares for something ; but the design of the architect, will fetch nothing, though it may have cost the inventor of it, months and months of his own slavery, (besides the expense of assistance,) if not the fortunate among a hundred, of which it may be the most scientific, the most tasteful, the most regular, the grandest, and the most convenient design ; for these are qualities, which in general it is useless to produce in a competition-design ; the very opposites of them most frequently governing the choice.

53. Perhaps nothing could better prove the bad effects of competition in architectural design, than the difference between the design of Mr. Savage and that of Mr. Barry, for the New British Houses of Parliament. No two architects are perhaps more equal in ability ; none have ever in modern times surpassed either of them, in knowledge of gothic architecture, and in general correctness of design in that style : yet what is the effect by sealed competition ? one borne up by hope has produced the most splendid design ever offered ; the mind wonders, how in this shrivelled age, he dared to design any thing so grand ; and most would have felt confident, that an indulgence in only one fourth part of such grandeur, would have insured them rejection :—the other excellent architect, almost the master of the first, seemingly without hope, has produced only a mere unfinished sketch, with his elevations all unstudied :—but if the competition, had been really open, with no affected sealing of names, no mottos, a fair open battle, and some payment guaranteed to the loser for his time and his expenses, then no doubt would *he* have produced something also of exquisite architecture.

54. The nation may take this pleasing assurance, that confided to Mr. Barry, a senate-house worthy of the empire, will be produced,—with every detail correct, not only in the principal parts of the pile, but also in the most retired parts of it. This excellent architect, is rarely found straying from his subject ; he studies it like a free-mason of the olden times ;—the nation should therefore second liberally his generous efforts ; it would afterwards be very proud of them : it should allow him to *build indeed*, substantially, with granite, with Portland stone, and with oak ;-it should deny him no proper ornaments ; they cost comparatively little ; and if denied now, regret will be felt hereafter : but the British nation, should forbid artificial stone, Bath stone, and all the other seeds of constitutional disease in architecture. But if after *all the advantages of competition*, committees, and national-ferment, this national pile should have the misfortune to be formed of mean materials, severely will another age handle those who may be the cause of such a misappropriation and destruction of national property and labor. To say any thing against the choice of Mr. Barry, would be ungenerous : if any one cannot rejoice that he has himself been selected for the work, he can at least rejoice that no quack or bungler is the man.

55. So ruinous to architecture, so destructive to property, is the competition between architects, that not only does it lead to errors, failures, and meanness among the works of the *inexperienced*, but even in the works of the *most experienced* professors. The spirit of architectural competition, seems to be exerted, in the trial of to what extent the ductility of white-wash may be carried. The examples of failure, through architectural competition, either directly or through the bad general depressing influence which it exercises, are very numerous.

56. The new Custom-House at London, was built, it is said, from a competition

design : this was indeed before the days of *ULTRA UN-ARCHITECTURAL FLIMSINESS*; before an architect was expected to produce grandeur, effect and stability, out of almost nothing, as though he were another Creator. Yet it is a bad building ;—it cost hundreds of thousands of pounds, in the first erection of it ; and after hundreds of thousands of pounds more have been expended upon its partial re-building, and in its re-adjustment—its external walls alone, still contain more than seventy indications of fracture and settlement, and although the reformation of the building has been performed, perhaps with all the care and prudence of which man is capable.

57. The College of Surgeons, was built from a competition design, by an architect of the very first talents, and of unblemished reputation ; here, the pernicious *charlatan* system, to be in competition on a level with expectation, led to the use of sham stone. In the *Diversions of Purley*, (the author of which, may be taken in *Philology*, to be *as egregious in a good sense*,—as in *Politics*, he was *egregious in a bad sense*) it is written, "*ALL CEMENT, is no more fit to make a FIRM building, than NO CEMENT AT ALL*:" and so, here has it proved : for the window-heads of the front of the building, broke story by story, as the gravelly heap advanced upwardly.

58. The City Club-house, was built from a competition design ; and being stuccoed externally, before it was painted appeared like a building modelled in dirt ; but not so, the Goldsmiths' New Hall, built by the same architect, not from a competition design. Now it would appear surprising, how little per cent. would have been added to the cost of the former edifice, if the front of it had been of Portland stone.

59. In fact, it may be taken as a rule, with very few exceptions, *that architectural competition, produces the worst design, to be executed in the worst manner, of the worst materials ;* for he, who after the choice, should endeavour to avoid such imperfections, would invariably be superseded. Scarcely a building, which has ever been erected from a competition design, will ever obtain renown hereafter, except for its grossness,—or for its failures through flimsiness or unscientific structure ;—the same evil report, will be the historical lot of even the new Parliament houses if the work be not undertaken soundly, legitimately, and honorably.

60. He who makes a competition design is afraid to produce any thing of proper architecture :—all those excellencies, which will be inevitably required in the end, must be kept from sight,—or the design will prove an useless toil :—hence most competition designs have low bastardy in their shape,—lower bastardy in their ornaments,—still lower bastardy in their structure,—and bastardy yet lower, in their materials. Shame to our age, shame to our presumption. Our fine old steeples, *(old centuries ago)* erected by men of daring yet elegant mind, require the fiery bolt to throw down their scientific masonry ;—but our modern buildings, crouching beneath the very first stage of their gigantic neighbours, fall apart and crack to pieces within the very first year after their erection.

61. But blessed be the day—the system has almost consumed itself :—lately a literary committee debated, whether the third premium to be offered for a competition design should not be the encouraging sum of *Two Guineas* ;—but that committee nobly agreed to stop at the second premium of *Five Guineas*, for fear of hurting professional feelings.

62. It sometimes happens, that premiums, amounting to only £200., are offered, in cases where, from want of funds, the proposed buildings cannot be erected ; and the designs received for these scandalous lotteries, if paid for, at the rate of journeymen carpenters' wages, of 5s. per day, would cost more than £2,000. :—and there is very frequently another attendant hardship, even when the building is to be erected, viz.—that *the architect is previously* chosen, but to save from appearance of partiality, an advertisement is put forth, and for no purpose other than this *cover:* the profession *for the honour* is thus put to so large an expense of time and money, besides the expense of models, travelling, &c., &c.

63. In competition, the umpires, become so confused with the flood of papers, that they themselves dread to turn them over; many of the drawings are not even looked at; many of the best of them go unobserved.

64. In nine cases out of ten, *the umpires are even unacquainted, with the usual modes of representing upon a plan, the different members of an apartment*; much less do they know, even the mere leading differences between Classical Architecture and Pointed Architecture; nor are they aware if they are confused together in the same building: hence it is impossible, that they can judge which is really the best: but perhaps they call to their assistance, some clever man of the neighbourhood, who has however less knowledge upon the subject than the author of the worst design presented. Thus, instead of an architectural, geometrical, sound, and handsome building being erected, some stercoraceous monster is the result.

65. The Author has always been averse to the foolish system of competition in architecture, from its injustice, and the uncertainty of its procuring good designs:—he has very rarely entered into such competition:—when about nineteen years old, he was incited to compete for a church; that was at a time, when a comparatively large sum was allowed; he knew none of the umpires; he fagged away for a considerable time,—and at last sat up all night for a whole week, in order to complete the drawings within the destined time: he proposed a lofty steeple, of pyramidal outline, and rich architecture; and the whole fabric to be built externally of Portland stone: fate kindly saved him from the discredit of youthful failure: another design was chosen, better than most which have been since carried into execution; but the work was completed, under the curse of swarthy perishable Bath stone. A few years afterwards, the Author was incited to venture another trial: he proceeded something as before, and with the same success; this time the money grew less, a meaner building was erected, and of the same perishable materials. A few years after this, a friend of the Author, who found after a sufficient number of defeats, that at length his turn of direct influence had arrived, being himself otherwise occupied, asked him to make the elevations for a cheap church: the competition was limited; the design was declared to be the best; but the integrity of the choice being disputed, a new and public competition was now ordered: the Author made a new design, containing some of the features of Gothic architecture; he had then studied the subject but little, had made little observation upon our ecclesiastical structures, and he possessed very few books upon the subject; the only merit, consisted in the Author having early imbibed a love for the more sacred character of the high-pointed architecture, with a distaste for the mixture of styles: in this instance, some other designs of considerable merit, were offered by old architects, who possessed an almost perfect knowledge of the architecture of the middle ages; their pains and knowledge were of no use in this instance; the Author's sealed design, was again declared to be decidedly the best; and with all its faults, it was carried into execution. Emboldened by this triumph, finding that he was not too stupid to produce a chosen competition design, the Author on two other occasions ventured to compete for small churches but in both cases without success: his opponents took their turn: in both instances his competitors' designs shewed a sovereign contempt for Gothic architecture, and a want of feeling for the subject; they were both carried into execution: the author of one of these designs, is well known to entertain a deeply rooted hatred of Pointed Architecture; the other was far too young, and had studied too little, to know even the very rudiments of Pointed Architecture.

66. It was then again the Author's turn, to make the design for an edifice, where there was a very limited competition, the unsuccessful to be paid for his drawings: this design gained the palm; it was carried into rapid execution, with most of its faults, and with the addition of some injurious alterations which were thought indispensable, but which were afterwards found to be not required. Since then, very lately, the Author was prevailed upon to enter once more into a

limited competition, and to make another design for a building, under very special restrictions: in two or three days after the drawings were furnished, the design of one closely connected with the parties, was chosen; it was made without the slightest regard to expense; it was magnificently drawn, although the sumptuary restrictions on that head were very stern: the Author's design, in which he endeavoured to unite as much of good construction, classical proportion, simplicity, and richness, as the destined funds would allow,—the Author's design was returned, without a crease upon the papers, and without the slightest evidence of having ever been unrolled and examined; but the selected design, was made to appear so magnificent, although most of its internal ornaments were to be of so un-architectural a material as mashed paper, that the actual tenders for the execution of the work, amounted to full twice the restricted outlay, and after much contention the business is now going to a new competition.

67. Reckoning that one hundred architects, usually compete together for one work, and that the baits or premiums average two in each competition, there must be at least fifty such competitions, before all the candidates can be successful; so that if an architect, practise through a long professional life of fifty years, and compete once every year, he may hope it to come once to his turn to obtain a premium of perhaps £50, or perhaps £20, while his designs may have cost him out of his life, full five years of time, besides a very great pecuniary expense. But then he has the honor—of being defeated forty-nine times—the honor of being deemed, incapable of obtaining a prize in the architectural lottery, except through undue influence:—it may be argued, that he is by all this practice, improving his taste and knowledge; this may be denied altogether; he who will not vilify his own architecture, will in general obtain in competition no choice, either by merit or by private influence.

68. Were it possible to unite in one person, the wisdom understanding and cunning of Bezaleel, and Aholiab, and of Hiram the widow's son,—the purity of the Grecian and Ionian architects Ictinus, Callicrates, Hermogenes and Pytheus,—the heavenward daring and boldness of Steinbach, Wykeham, and of the other Gothic architects,—the grandeur and sublimity of Buonarotti—the elegance of Raffaello,—the chasteness of Palladio and Jones;—the deep science of Archimedes,—the mathematical skill and the mastery of outline and perspective of Wren,—the nobleness, finished delicacy, and correctness of Stuart,—and the beautiful proportion and extreme finish of Chambers,—were it possible for an architect, so endued, to come unknown to England, and to strive to do his best, and to send a design in sealed competition—wisdom, understanding, cunning, purity, daring, boldness, grandeur, sublimity, elegance, chasteness, deep science, mathematics, outline, perspective, nobleness, finished delicacy, correctness, beautiful proportion—would avail him nothing: he might compete fifty times, and at last gain £20—not by his talents, industry and learning, but through corruption. The Author knows of no one, who really believes that he ever obtained a premium, simply by the merit of his design.

69. On this important subject no apology needs be made, for inserting the sentiments of the excellent Alberti, who the very first in order of time among the modern writers upon architecture, after the lapse of four centuries of intelligence, still continues to be the first in merit; the work of no other architectural writer, contains such a fund of information, and such marks of the man of learning, industry, and accomplishments.

" E' mi piace che in questo luogo non si lasci indietro, quel' che si appartiene " allo architettore. Tu non hai a andare spontamente cosi a servire ogn'uno " che dice di volere edificare. Il che, i leggieri, & i boriosi piu che il bisogno, " sogliono fare. Io non so se egli è da aspettare che e' te ne richiega piu & " piu volte. Bisogna che da per loro ti credino, & che eglino habbin' fede in te, " chi si vuol' servire dell' opera & del consiglio tuo, o perche vorrò io offerire le " mie degne & utili inventioni senza haverne frutto nessuno, a fare, che o uno,

" o un' altro ignorante mi creda?—merita per dio certamente premio non me-
" diocre il farti con gli avertimenti miei piu esperto, in quella cosa nellaquale io
" ti rispiarmi grandissima spesa, & giovi oltra modo, & alle commodità, & a'
" piaceri tuoi, è cosa da savio il sapersi mantenere la reputatione, & è a bas-
" tanza dare fidáto consiglio, & disegni lodatissimi a chi te ne ricerca ; che se
" per aventura tu piglierai il lavoro sopra di te, & che tu vogli esserne sopra-
" stante, & quello che ne dia fine, durerai grandissima fatica a schifare, che tutti
" i difetti di altri, & tutti gli errori o per ignorantia, o per negligentia commessi,
" non sieno a te solo imputati. Queste son' cose da commetterle a soprastanti
" diligenti, accurati, rigidi, severi, che proccurino il modo con il quale le cose si
" habbino a fare, con studio, industria, & diligentia, & assiduità. Vorrei ancora
" per quanto è possibile, che tu avertisca di non ti impacciare se non con persone
" splendide & con i Principi delle cittadi, cupidissimi di queste cose. Conciosia
" che le tue fatiche date a chi si voglia che non sieno persone qualificate diventano
" vili. Quanto pensi tu che ti giovi, la authorità de gli huomini grandi, a' quali tu
" ti sia presupposto d'havere a servire, inquanto alla gloria. Io sono un' di quelli,
" che (oltre a che a la maggior parte de gl' huomini non sò perchè alcuna volta
" pare, che gli huomini grandi habbino miglior' gusto, & miglior' giudicio al
" parere del vulgo che in effetto non hanno). Io dico che sono uno di quelli che
" vorrei, che a lo architettore fussino date prontamente, & in abbondantia tutte
" quelle cose, lequali sono di bisogno a mettere ad effetto tal' Muraglia."—
Lib. 9. *cap.* 11.

70. In conclusion is here added, what Vitruvius says on this head.

" Other architects canvass, and go about soliciting employment, *but my*
" *preceptors instilled into me a sense of the propriety of* BEING REQUESTED, *and*
" NOT OF REQUESTING, *to be entrusted, inasmuch as the ingenuous man will blush*
" *and feel shame at asking a favor ;* for the givers of a favor and not the re-
" ceivers, are courted. What must he suspect who is solicited by another to
" be entrusted with the expenditure of his money, but that it is done for the sake
" of gain and emolument? Hence the ancients entrusted their works to those
" architects only who were of good family and well brought up ; thinking it
" better to trust the modest, than the bold and arrogant man. These artists
" only instructed their own children or relations, having regard to their integrity,
" so that property might be safely committed to their charge. When, therefore,
" I see this noble science in the hands of the unlearned and unskilful, of men
" not only ignorant of architecture, but of everything relative to buildings, I
" cannot blame proprietors, who relying on their own intelligence, are their own
" architects ; since, if the business is to be conducted by the unskilful, there is
" at least more satisfaction in laying out money at one's own pleasure, rather
" than at that of another person."—*J. Gwilt's Vitruv. lib.* 6.

71. *Good architecture can alone result from mutual confidence ;—confidence on the part of the patron, that he is employing a man of skill and integrity, who he is sure will be of benefit to him,—and confidence on the part of the Professor, that his pains judgment and labor, will be appreciated according to their worth and honesty : architecture so practised is above most arts and professions ; practised otherwise, it becomes the most injurious, the most extravagant, and the lowest of trades.* Nearly all our best architects who are much above sheer beggary, will hardly risk their time, their money, and their reputation, upon the random cast of the Architectural Competition Die, by which they might lose their justly earned fame, but by which they could not regain it.

CHAPTER XIX.

Of the Aim of a real Architect in undertaking a work.

72. It is the architect's business, to produce the greatest convenience strength duration and beauty, out of the funds which are entrusted to his care; if he fail in any one of these particulars, his work is not a piece of architecture.

73. If he fail in convenience, his reason has been worse than useless to him; for even those animals which are without reason, adapt their several habitations, in the most admirable manner to their particular wants and habits: if he fail in strength, let him ask himself, where do we in the nests of birds and insects find ruin, unless from extraneous destruction? if he fail in duration, let him examine whether the dwellings of inferior animals require renewal, unless destroyed by the hostility of other tribes, or by the shocks of nature.

74. If he fail in beauty, let him go with shame to the architecture of the bee and the hornet; let him examine it with a microscope, and see if he can find a fault against symmetry or geometry: these industrious and heaven-enlightened creatures, have no compasses, yet they work with the greatest accuracy: our dwellings, are a mass of ruins irregularity and meanness; we dispute with our neighbours about a few inches of ground; but these creatures, have time-out-of-mind, known how to form their structures, both with security and geometrical perfection; they are of such a scientific and exact form, that no dwelling encroaches upon its neighbour; such an encroachment would spoil its geometrical beauty; while in its hexagonal plan, are contained one half of the problems and their solutions, about which the most skilful human geometricians have busied themselves.

75. In the works of nature, whether grand or minute, not a fault can be discovered, not even an appearance of neglect or slovenliness: what a shame then is it to man, to destroy those perfect materials of which a bountiful Providence has made him the steward; the more closely they are examined by the microscope, the more excellent in structure are they found; they are all excellent, properly used; they are all blessings; they are all good for something; their mis-application alone is bad. What a shame is it to man, to pile up in a rude coarse crazy and unhandsome manner, the good materials with which Providence has blessed him, to mar them by folly and ignorance, and to call such an assemblage of malformation, *a temple*.

CHAPTER XX.

Of the Injury which has occurred to Practical Building, by the separation of the Art into the two branches of Architecture and Civil Engineering.

76. Formerly, every architect was a civil engineer, and every civil engineer was an architect; but from the vast employment in modern times, in the making of canals docks bridges and rail-roads, the profession has become split up into two; and this has tended, perhaps more than any other circumstance, to the ruin of real practical science in architecture.

77. The architect is now rarely able, from the want of an enlarged practical knowledge, to execute a great and extraordinary work; while the civil engineer, from practical and scientific knowledge, is able in most cases, with perfect success, to accomplish the most extensive works; but from a want of acquaintance with the kindly nature of design, a very large portion of his work, seems as though uncouthness and offensiveness to vision, had been even rather more the object than usefulness; he seems to forget, while he is imitating the economy of nature in

her wise structure of the bones of animals, that nature rounds and graces her skeletons, with the outward clothing and beauty of flesh and muscle. The engineer will do well, to consider, that if to the successful accomplishment of his grand works, he can add the charm of beautiful form, he will acquire the immortality of popular fame the pecuniary profit of which, will well repay him for his pains and study. The beautiful forms of the new London Bridge, of the new Bridge at Turin, and of the Edystone Lighthouse, shew of what Civil Engineering is capable without sacrifice of practical utility.

CHAPTER XXI.

Of the modern system of Architectural employment; and of the injury which thereby falls upon the employer.

78. The modern system of architectural employment, is, too many of us grieve to confess, a complete system of supplanting; instead of the former high-souled race of professional men, each of us is now almost compelled to be a supplanting Jacob, without Jacob's virtues. If one, however, with talent and integrity, fulfil the true duties of a real architect, his pains are too often received with an ill grace; he passes for an extravagant fool, if in his drawings he provide that which is requisite for substantiality,—if in his specification, he has the folly to describe that which his forethought knows will be absolutely requisite to complete a building,—and if he should have the still further imprudence, to estimate exactly the probable inevitable cost of such a building, and should against his own interest inform his employer of it, that employer having before been deceived by false estimates, will double or treble the amount, and affrighted, will either lay aside his design of building, or then employ some other less competent and less honest surveyor. Hard stock-bricks set in stone-lime, will then give place to soft bricks scarcely burnt, set in chalk; oak and Baltic fir timber, will be exchanged for Canadian bug-pine; modest stone cornices, will be replaced by gaudy tattered frippery in grimy plaster; the flooring-boards will diminish to $\frac{3}{4}$ in. in thickness; the doors, from 2 in. to $1\frac{1}{4}$ in.; the smooth and square internal stucco and other plastering, will become supplanted by thin ragged cracked and peeling mortar-skimmings: in fine, nothing will remain as a respectable person would have it; but the estimate for such a building, comes within the employer's proposed outlay, and that is to possess every virtue. It does not occur to the gentleman, to build *well, but on a smaller scale, with capabilities of gradual additions.* With regard to design, or ornament, those assumed follies are now quite forgotten.

The building is in fine completed, but not for the estimated amount; many extra works are required, in order to huddle it together in any way; the surveyor and his employer quarrel; the former luckily gets paid, his employer thinking that the sooner he gets rid of him the better: in the mean while, the walls crack; the plaster-concealed sham arches give way; the piers descend into the openings, which by the flight of science, have been placed beneath them; the floors sink tremble and gape; the doors and shutters crack shrink and become transparent; the roof and gutters, through settlement and bad construction, admit the wet in many directions; in fact the poor deceived and self-deceived employer, dreads to enter his economical mansion, for fear of *un fracásso;* the fabric becomes worse and worse: at length overcoming his shame-faced reluctance, he writes to his former surveyor, and prays him to come and assist him in his misfortune: the nauseous task is undertaken; an endeavour is made, to reform in part, the malformations and radical defects of the building; the work is partially re-built, is patched up, re-roofed, and rendered habitable; the deformed inconvenient heap of wretchedness, with the necessary additional props and buttresses, costs nearly

double the first terrific estimate for a good building; and the sorrowing employer, promises in future to employ none but his "*tried friend*," but really sickened of building, he never afterwards has any business worth engaging in.

This picture is so true to nature, that many existing gentlemen will acknowledge its correctness.

CHAPTER XXII.

Of the Fondness which many Employers, have for deceiving themselves relative to the probable Cost of a Building.

79. Of nothing are architectural employers more fond than of deceiving themselves as to the intended outlay; many of them are astonished, if you give them an idea of what is likely to be the real outlay, for a good, though very plain building, substantially constructed.

80. The careful young architectural practitioner, will occasionally feel some mortification, from cases of this nature; from those who wish to be flattered, not to be honestly and discreetly advised,—from such patrons he will at times experience humiliation; occasionally, while he keeps to an unbending course of careful integrity, he will find another, whom he knows to be incompetent careless and perhaps unprincipled, step into his place and deprive him of an undertaking; let him still persevere, in a steady, careful, pains-taking, and industrious course, and his reputation will be made, while his supplanter having lost his, will be employed in the ungracious duty of having to correct his failures, and that perhaps justly at his own expense.

81. The author once knew a case in which it was intended to lay out 1000*l.* in building the carcase of a parochial school, (and such a building has no finishings,) but before the building was complete, the sum of 4,500*l.* was expended.

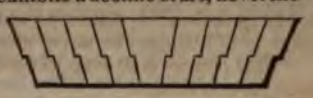
CHAPTER XXIII.

Of some of those Literary and Graphic Works, which a Practical Architect, may possess and consult with advantage to himself.

82. Among those literary and graphic works, which a practical architect, may possess and consult with advantage to himself, are those which will be found mentioned in the under-written list:—but while producing this list, the Author hereby declares once for all, that though in any instance, he may speak with high praise of any particular work, or of any particular matter contained in such work, he does not thereby mean to pass an opinion, upon every theory or statement therein put forth,—but only to give a generally favourable opinion of it,—and to praise at that time, the portions of the work of which he is then treating;—for the practical architect, must from experience, know whether he ought to rely upon every thing, contained in a work of instruction or reference; and it is not because some portion of a work, may be defective or erroneous, that we are to refuse to profit by the good contained in such work; for if an indiscriminate condemnation of a work were to take place, because of one or more faults, literary men would be so deterred from benefiting the world by their productions, that we should remain altogether without scientific and other literature.

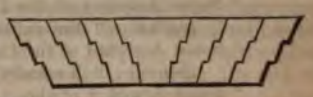
83. Adam's (Robert) "*Ruins of the Palace of the Emperor Diocletian, at "Spalatro, in Dalmatia.*"—A.D. 1764. This very fine and illustrative architectural work, is well worthy of observation and study, for its development of the art of composing the general plan, the vaulting, the doming, and the roofing of edifices,

The architecture of Diocletian's Palace, though it exhibits a decline of art, nevertheless contains many parts of surprising boldness and beauty. The constructive architect, will not fail to observe the curious form of the voussoirs of the lintels of the gateways of the palace.



84. d'AGINCOURT's (Jean-Baptiste-Louis-Georges Seroux.) "*Histoire de "l'Art, par les monumens, depuis sa décadence au 4e. Siècle jusqu'à son Renouvellement "au 16e. Ouvrage enrichi de 325 Planches.*"—Paris, A.D. 1823. This magnificently printed work, contains a surprising assemblage of talent and research: the infinitude of its remarks and illustrations, must enlarge the stock of information possessed by the most learned in architecture: the grand scope of the subject, and the literary and typographical excellence of the letter-press, of this most important and laborious publication, deserve engravings of a much higher character:—a good English edition, of the part of this work which relates solely to architecture, would be a valuable addition to an English architect's library, and would form an excellent companion to *Hope's* "*Essay on Architecture*," the less scientific character of which, it would serve to illustrate. It is to be regretted that so many of the French architectural works of the present day, are illustrated by such very mean embellishments.

The accompanying singular form of arch, taken from the reputed tomb of Theodoric at Ravenna, is given in this work.



85. ALBERTI's (Leon Batista) "*De re Ædificatoriâ.*" Florence, A.D. 1485. The original Latin text of this work is scarce; and the early Italian translation of it by Cosimo Bartoli, is most generally used and quoted; the ordinary English translation of it, by James Leoni, is made from the Italian: in many respects, the Italian copy may be esteemed, from the circumstance, of there being some dispute, as to the proper modern terms, in which technical words should be translated from the Latin; and perhaps Bartoli, from living so much nearer the architect's own time, knew better than a more recent translator, how to render the author's technical words according to their accepted meaning:—with regard to this work, it is to be regretted, that while all excellent architects, have in times past united in their esteem of it,—to the discredit of the present age, the most worthless modern publications, are now in England sometimes esteemed more than this valuable work: no other architectural literary work in existence, contains such a fund of delightful and entertaining information: and it is no slight praise, that this admirable author, the very earliest modern writer upon classical architecture, appears from his own industry and learning alone, to have been more deeply versed in ancient architecture, than any other man since his day: in this respect, though we moderns may assume more, may conceal our ignorance under the assumption of *mere Grecian names*, we too often assume only the cloak of ignorance. Alberti's work is valuable, for its theoretical and practical rules on constructive and decorative architecture. His delineations are imperfect, from that department of the art being then in its infancy; but inaccurate as they are, they are more correct than a very large proportion of our modern English edifices. The author possessed a noble spirit, an amiable and a highly intellectual mind, an unbending integrity, and a generous heart;—a polished gentleman of his time, he was not too proud (or rather was not too mean) to go into the very atoms of constructive knowledge.

86. ALLASON's (Thomas) "*Picturesque Views of the Antiquities of Pola in "Istria.*"—London, A.D. 1819. This work, though to the practical professor of less use than plans elevations and sections, should be possessed by every architect: the work contains some elegant details of fragments of art: and few architectural antiquities are more beautiful than some of those still remaining at Pola.

87. "ANTIGÜEDADES ARABES DE ESPAGÑA." This fine work, published at Madrid A.D. 1804, exhibits the remains of the Moresco architecture at Grenada and Cordova, including delineations of the palace, attached by the Emperor Charles the Fifth to the Alhambra.

88. ANTIQUARIES (The Society of) OF LONDON. The following works are by this venerable society, the earliest labourer in the field of archaeologia and Gothic architecture :—

"*Vetusta Monumenta*," the 1st vol. published A.D. 1747. The volumes of this curious and valuable work preserve the memory and image of many architectural remains of beauty and interest.

"Some Account of the Collegiate Chapel of St. Stephen, Westminster. By John Topham, Esq.;" illustrative of "Plans, elevations, sections, and specimens of the architecture and ornaments of the remaining parts" of that building, from drawings made by John Carter. A.D. 1795.

"Some Account of the Cathedral Church of Exeter," by Charles Lyttelton, LL.D., Bishop of Carlisle, and Sir H. C. Englefield; "illustrative of the Plans," &c. by J. Carter. A.D. 1797.

"Some Account of the Abbey Church at Bath," by Sir H. C. Englefield; "illustrative of the Plans," &c. by J. Carter. A.D. 1798.

"Some Account of the Cathedral Church of Durham," by Sir H. C. Englefield; "illustrative of the Plans," &c. by J. Carter. A.D. 1801.

"Some Account of the Cathedral Church of Gloucester," by Sir H. C. Englefield; "illustrative of the Plans," &c. by J. Carter. A.D. 1809.

"Some Account of the Abbey Church of St. Alban," by Richard Gough, John Carter, James Brown, and John Nicholls; "illustrative of the Plans," &c. by J. Carter: the whole revised by Sir H. C. Englefield. A.D. 1813.

89. ANTIQUARIES (The Societies of) of NEWCASTLE, SCOTLAND, FRANCE, NORMANDY, AND AMERICA. These societies, some of which are only recently founded, have not as yet produced publications of such importance as those by the Society of London; but there is little doubt, that these and other similar associations, will soon collect a vast body of information on subjects of architecture and antiquities, which will prove valuable and interesting to the practical architect, as well for form as for construction.

90. "ARCHAEOLOGIA: *or Miscellaneous Tracts, relating to Antiquity.*" *Published by the Society of Antiquaries of London.* This work is an invaluable production, on subjects, very few of which are not of interest to the architect; indeed, every thing contained in the numerous and increasing volumes of this chronology of information, may be said to be, either nearly or remotely connected with architecture; nor can many of the tracts, be other than pleasing, to a professional man of an unbiassed and inquiring mind; the work contains the immediate records, of many valuable discoveries,—and many of the tracts upon Gothic Architecture, are of the very first importance: the following list, contains the titles of such of the papers as are more immediately connected with our subject.

VOLUME I. A.D. 1770.

§§ V. VI. IX.—"*Observations on Shrines:*" by John Loveday, Esq. and others.

§ XXVIII.—"*On the Trajan and Antonine Pillars* at Rome, by Martin Folkes, Esq." This paper contains an exact description of the structure and dimensions of these two columns.

§ XXX.—"*Notes* on the Walls of Ancient Rome." Communicated by Mr. Wray.

§ XXXIV.—"*Dissertation* by the Dean of Exeter" *(C. Lyttelton)* "on the antiquity of Brick Buildings in England, posterior to the time of the Romans."

§ XXXVI.—"*Some Account* of St. Peter's Church in the East, Oxon, from an old MS. Communicated by Mr. James Theobald," with three Engravings.

§ L.—"*Observations on Welsh Castles:* by the Honourable Daines Barrington."

§ LII.—"*An Extract* relating to the Round Tower at Ardmore in Ireland: by Mr. Peter Collinson." One Engraving.

VOLUME II. A.D. 1773.

§ V.—"*An Account* of a remarkable Monument in Penrith Church Yard, Cumberland. By Dr. Lyttelton, then Dean of Exeter."

§ XI.—"*Observations* on Mr. Peter Collinson's Paper on the Round Towers in Ireland;" By Owen Salusbury Brereton, Esq.

§ XII.—"*Observations* on the Round Tower at Brechin, in Scotland. By Richard Gough, Esq." One Engraving.

§ XXVIII.—"*The construction* of the old wall at Verolam. *The Roman Bricks* compared with the Modern, &c. In a Letter to Bishop Lyttelton. By Mr. Webster."

VOLUME III. A.D. 1775.

§ XXXV.—"*Remarks* on the Abbey Church of Bury Saint Edmund's, in Suffolk. By Edward King, Esq." With a plan of the church and one other Engraving.

VOLUME IV. A.D. 1776.

§ VII.—"*Remarks* on the Antiquity and the different Modes of Brick and Stone Buildings in England. By Mr. James Essex, of Cambridge." With one Engraving. This paper is valuable.

§ XIII.—"*Some Observations* on Lincoln Cathedral. By Mr. James Essex." One Engraving.

§ XXV.—"*Observations* on Ancient Castles. By Edward King, Esq." With four Engravings. This tract is very curious and valuable.

VOLUME VI. A.D. 1782.

§ V.—"*Observations* on Reading Abbey, by Sir Henry Englefield." This paper contains, a very interesting account of a roof with stone ribs, filled in between with a substance "evidently a tophus formed by some petrifying spring," and so light that compared with Portland stone, its weight is only as 66 to 161.

§§ IX. X.—"*A further description* of ancient Fortifications, in the North of Scotland: by Mr. James Anderson," and "*Observations* on the vitrified Walls in Scotland, by the Honourable Daines Barrington," with three Engravings. These tracts contain some very curious matter upon the same subject.

§ XXIII.—"*Observations* on the Origin and Antiquity of Round Churches; and of the Round Church at Cambridge in particular. By Mr. James Essex." With one Engraving.

§ XXVII.—"*Sequel to the Observations* on Ancient Castles. By Edward King, Esq." with thirty-two Engravings. This is a most important and valuable treatise, with many minute details.

§ XXVIII.—"*Additions* to Mr. King's account of Lincoln Castle. By Sir H. C. Englefield, Bart." with two Engravings.

§ XXIX.—"*Observations* on Rochester Castle, by the Rev. Mr. Samuel Denne."

VOLUME VII. A.D. 1785.

§ XXXI.—"*An Account* of some artificial Caverns in the Neighbourhood of Bombay. By Mr. William Hunter, Surgeon in the East Indies." This excellent account of the cave of Elephanta, &c. is valuable.

§ XXXIV.—"*Account* of a curious Pagoda near Bombay, drawn up by Captain Pyke, who was afterwards Governor of St. Helena." With seven Engravings. This account agrees with the preceding one by Mr. Hunter.

§ XXXV.—"*Extract* by the late Smart Lethieullier, Esq. from the Papers of the late Charles Boon, Esq.," "giving an account of the great Pagoda on the Island of Salset."

§ XXXIX.—"*Observations* on the Remains of the Amphitheatre of Flavius Vespasian at Rome, as it was in the year 1777. By Mr. Thomas Hardwick, F.A.S." This paper notices some oversights of Desgodetz, and relates some discoveries by the author of it.

§ XLV.—"*A Description* and Plan of the ancient Timber Bridge at Rochester, collected from two MSS. published in Lambarde's Perambulation of Kent. By Mr. Essex," with one Engraving.

VOLUME VIII. A.D. 1787.

§ XIX.—"*Observations* on our antient Churches. By the Rev. Mr. Ledwich, F.A.S." With three Engravings.

§ XXIV.—"*An Account* of the Caves of Cannara, Ambola, and Elephanta, in the East Indies; in a letter from Hector Macneil, Esq., then at Bombay." A very curious and minute description.

VOLUME IX. A.D. 1789.

§ XI.—"*Observations* on the Origin and Progress of Gothic Architecture, and on the Corporation of Free Masons, supposed to be the Establishers of it as a regular Order. In a letter from Governor Pownall, to the Rev. Dr. Lort." This paper is ingenious, and contains one Engraving.

§ XXV.—"*Observations* on the Round Towers in Ireland, by the Rev. Thomas Harmer."

VOLUME X. A.D. 1792.

§ III.—"*Observations* on Canterbury Cathedral. By the Rev. Mr. Denne."

§ VI.—"*Description* of two antient mansion houses, in Northamptonshire and Dorset. By Richard Gough."

§ VII.—"*Extracts* out of an old Book, relating to the Building of Louth Steeple and repairing the Church, &c., from about the year 1500 or 1501, to 1518. Communicated by Sir Joseph Banks, Bart." This is a very valuable and curious paper both as to the *method* and the *price* of ancient building.

§ VIII.—"*Account* of the ancient Modes of Fortification in Scotland. By Robert Riddell, Esq."

§ XII.—"*Observations* on the *Machine called the Lewis*. By Francis Gibson, Esq." A curious paper, with one Engraving.

§ XIII.—"*Description* of the Church of Quenington, in the county of Gloucester. By Samuel Lysons, Esq." With three Engravings.

§ XVII.—"*Observations* on Vitrified Fortifications in Galloway. By Robert Riddell, Esq."

§ XVIII.—"*A Mosaic Pavement*, in the Prior's Chapel at Ely; with a brief Deduction of the Rise and Progress of Mosaic Work, since the introduction of Christianity. By Richard Gough."

§ XXIII.—"*Observations* on an antient Font at Burnham Deepdale, in Norfolk. By the Rev. Samuel Pegge." With one Engraving.

§ XXIV.—"*Description* of the old Font in the Church of East Meon, Hampshire, 1789: with some *Observations* on Fonts. By Richd. Gough." With ten Engravings.

§ XXV.—" *Three Letters*, from Mr. Samuel Carte to Dr. Ducarel, and one to Sir Thos. Cave, Bart. concerning Fonts."

§ XXIX.—" *Remarks* on the Stalls near the Communion Table in Maidstone Church, &c." " By the Rev. Samuel Denne." This paper contains a reference to many examples.

§ XXX.—" *Further Remarks* on Stone Seats in the Chancels of Churches, Cathedral, Collegiate and Parochial. By the Rev. Samuel Denne."

§ XL.—" *Description* of the Great Pagoda of Madura, the Choultry of Timul Naik, in a Letter from Mr. Adam Blackader."

VOLUME XI. A.D. 1794.

§ I.—" *Observations* on Pliny's Account of the Temple of Diana at Ephesus. By Thos. Falconer, Esq." With one Engraving.

§ XVI.—" *Notices* of Fonts in Scotland. By Robt. Riddell, Esq." With one Engraving.

§ XVII.—" *Evidence of a Lavatory*, appertaining to the Benedictine Priory of Canterbury Cathedral; and *Observations on Fonts*. By the Rev. Samuel Denne." With two Engravings.

§ XIX.—" *The Rates of Wages* of Servants, Labourers, and Artificers, set down and assessed at Okeham, within the county of Rutland, by the Justices of Peace there, the 28th day of April, A.D. 1610. Communicated by Thos. Barker, Esq."—" The Rates of Wages of all Manner of Servants," &c., in Warwickshire, 36 Car. II.: communicated by Mr. Nichols. These papers contain very exact and interesting historical records of prices.

§ XXIII.—" *Observations* on Episcopal Chairs, and Stone Seats; as also on Piscinas, and other appendages to Altars, still remaining in chancels; with a *description* of Chalk Church, in the diocese of Rochester. In a letter from Mr. Charles Clarke." With four Engravings.

§ XXIV.—*A brief Survey* of part of Canterbury Cathedral, as described by Eadmer and Gervase; and a Review of Mr. Clarke's Opinion of the original Use of Stone Seats in Chancels." By the Rev. Samuel Denne, F.A.S.

VOLUME XII. A.D. 1796.

§ XII.—" *Mr. Denne's Observations* on a Triple Stone Seat, at Upchurch, in Kent." With two Engravings.

§ XIV.—" *An Essay* towards a History of the *Venta Icenorum* of the Romans, and of Norwich Castle; with Remarks on the Architecture of the Anglo-Saxons and Normans. By W. Wilkins, of Norwich." With twenty-three Engravings.

VOLUME XIII. A.D. 1800.

§ XXVII.—" *A Description* of the Church of Melbourne, in Derbyshire, with an Attempt to explain from it, the real Situation of the Porticus in the ancient churches. By Wm. Wilkins, Esq., F.A.S." With three Engravings.

VOLUME XIV. A.D. 1803.

§ X.—" *Account* of a Brick, brought from the Site of ancient Babylon, in a Letter from Nathaniel Hulme, M.D., F.R.S., and F.A.S. to the Rev. John Brand." This is very curious and valuable.

§ XVII.—" *An Account* of the Prior's Chapel at Ely, by W. Wilkins, Esq., F.A.S." With six Engravings.

§ XXXII.—" *An Account* of the Walls of Constantinople." By the Rev. Jas. Dallaway. With four Engravings.

VOLUME XV. A.D. 1806.

§ XXXII.—"*Description* of the ancient Building at Norwich, which is the subject of the preceding Paper," viz. the remains of the Dormitory and Refectory which stood on the south side of the cloisters. "By John Adey Repton, Esq. F.A.S." With three Engravings.

§ XXXVI.—"*Account* of some Remains of Gothic Architecture" (principally Pisan) "in Italy and Sicily, by R. Smirke, Esq., Jun. F.A.S." With four Engravings. And "*Further Remarks*" by the same gentleman. § XXXVIII. With two Engravings.

VOLUME XVI. A.D. 1812.

§ XXV.—"*Some Account*" "of the Bottoms of Escutcheons or Shields as they partake of the prevalent Forms of Arches in their respective Periods: by J. A. Repton, Esq., F.A.S." With two Engravings.

§ XXVI.—"*Mémoire* sur un Aquéduc Romain découverte à Antibes: par M. d'Aguillon." With two Engravings.

§ XXXIV.—"*Some Observations* on the Gothic Buildings abroad, particularly those in Italy; and on *Gothic Architecture in general*. By T. Kerrich, M.A., F.A.S., Principal Librarian to the University of Cambridge." With eighteen Engravings. This very valuable paper contains opinions relative to gothic arches, both by Mr. Kerrich and the late Mr. Essex of Cambridge.

§ XXXVII.—"*Specimens of Fonts*, collected from different Churches, by John Adey Repton, Esq., F.A.S." With nine Engravings.

§ XL.—"*A Description* of a Font in the Church of South Kilvington," Yorkshire: "by R. D. Waddilove, D.D., F.A.S. Dean of Ripon." With one Engraving.

Appendix to the 16th vol.—Ten Plates of beautiful Saxon or Norman architectural details: by J. A. Repton, Esq.

VOLUME XVII. A.D. 1814.

§ I.—"*Observations* on the Origin of Gothic Architecture:" "communicated by Geo. Saunders, Esq. F.R.S. and F.A.S." With four Engravings. This paper contains discriminating observations upon groined arches.

§ III.—"*Observations* on Vaults. By Samuel Ware, Esq." With four Engravings. This paper is extremely valuable.

§ X.—"*An historical and descriptive* Account of Ripon Minster:" "by the Rev. R. D. Waddilove, Dean of Ripon, F.A.S.

VOLUME XVIII. A.D. 1817.

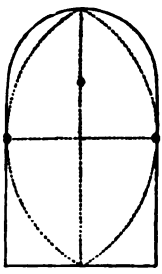
§ XVII.—"*Observations* upon some Sepulchral Monuments in Italy and France. By T. Kerrich, M.A. &c." With eight Engravings.

§ XI.—"*Observations* on the Origin of the principal Features of Decorative Architecture: by S. Ware, Esq." with three engravings, shewing sections of St. Paul's Cathedral, the Temple Church, and Henry the Seventh's Chapel, at Westminster.

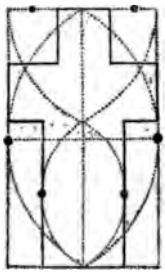
VOLUME XIX. A.D. 1821.

§ XXXVII.—"*Observations* on the Use of the Mysterious Figure, called *Vesica Piscis*, in the Architecture of the Middle Ages, and in Gothic Architecture; by T. Kerrich, M.A. &c," with fifteen engravings. This paper is an extremely talented production, reducing to rule many of the seeming irregularities in the proportions of the several members of Gothic architecture, and it promises to afford materials for some future work, upon a real development of the principles which governed the works of the Gothic architects.

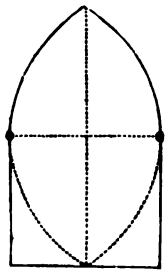
The adjoining cuts, will afford some notion of the learned author's suggested principles, with regard to the ancient geometrical use of the *Vesica Piscis*. The original paper contains a multitude of different examples of its application.



Apertures in Romanesque, Byzantine, Lombardic, Saxon, or Norman architecture.



General outlines of the plan of a Cathedral or Great Church.



Apertures in Gothic or Pointed architecture.

VOLUME XX. A.D. 1824.

§ XII.—"*Remarks* on the Gothic Ornaments of the Duomo, Battistero, and Campo Santo, of Pisa; by Arthur Taylor, Esq." This paper, contains some very curious and exact investigation, relative to the super-addition upon those buildings of the ornaments of the pointed style of architecture.

VOLUME XXI. A.D. 1827.

§ XVIII.—"*Observations* upon some Ancient Buildings in Prussia; by J. A. Repton, Esq.," with six engravings, exhibiting some very curious specimens of Gothic architecture executed in brickwork.

§ XIX.—"*Letter from* T. Amyot, Esq." "accompanying Drawings of the Priory Gate and Font at Kirkham, in Yorkshire, and of the Interior of the Room at Bolton Castle, in which Mary Queen of Scots was confined in 1568," With three Engravings.

§ XXXV.—"*Observations* on the Origin of the Pointed Arch in Architecture: in a letter from Sydney Smirke, Esq." With two Engravings.

VOLUME XXII. A.D. 1829.

§ XX.—"*Account* of certain Hill Castles, situated near the Land's End, in Cornwall; in a communication from Wm. Cotton, Esq." With two Engravings.

VOLUME XXIII. A.D. 1831.

§ I.—"*Account* of a Sepulchral Monument in the Campo Santo at Pisa; with Observations on the disputed Date of that Building: in a Letter from S. Smirke, Esq." With one Engraving.

§ II.—"*Observations* on the Round Church Towers of Norfolk; and on the material employed in constructing the early religious Buildings in that County. By Samuel Woodward, Esq."

§ III.—"*Observations* on the Ecclesiastical Round Towers of Norfolk, and Suffolk; in a letter from John Gage, Esq." With eight Engravings. This is a very valuable paper.

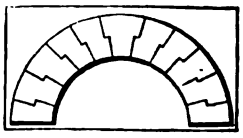
§ VII.—"*Account* of some Architectural and Sculptural Remains at Pæstum; with Observations on the reference, the latter may bear to the Mythological History of that City: in a Letter from Wm. Hosking, Esq." With two Engravings.

§ XI.—"*Disquisition* on the Member in Architecture, called an Oriel. In a Letter from Wm. Hamper, Esq.

§ XII.—"*Observations* on the mode of Construction of the present old London Bridge, as discovered in the years 1826 and 1827: in a letter from Wm. Knight, Esq." With three Engravings.

§ XVI.—"*Letter* addressed by John Gage, Esq., F.R.S. &c. to H. Petrie, Esq., accompanying drawings of Remains of the Prior of Lewes' Hostelry, in the parish of St. Olave, Southwark;" With six Engravings.

§ XIX.—"*An Account* of the Mausoleum of Theodoric, at Ravenna; in a letter from S. Smirke, Esq." With two Engravings.



The curiously formed arch here shewn, is taken from the lower story of this remarkable building.

VOLUME XXV. A.D. 1834.

§ V.—"*Notices* of the Palace of Whitehall; in a letter from S. Smirke, Esq." With three Engravings.

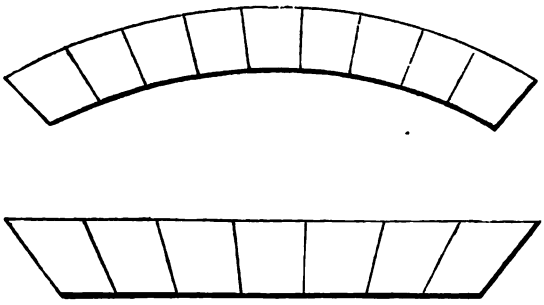
§ XI.—"*Four Letters* on the Ecclesiastical Architecture of France; addressed to John Gage, Esq., by Thos. Rickman, Esq." With nine Engravings.

§ XXVI.—"*An Account* of the Remains of the Palace at Ravenna, reputed to have been that of the Gothic King Theodoric. By S. Smirke, Esq." With one Engraving.

Appendix to the twenty-fifth vol.—Two engravings of the plan and of an interior view of a small building, known by the name of Queen Elizabeth's Bath, formerly standing near the site of the King's Mews, at Charing Cross, Westminster. This example is worth consideration for its ribs and vaulting of brick-work.

91.—ARUNDALE'S (F.) "*Select Specimens of the Edifices of Palladio.*" London, A.D. 1832. This work contains twelve folio engravings, illustrating four of Palladio's buildings at Vicenza, viz. the Olympic Theatre, the Palazzo Chiericati, the Screen to the Sala della Raggione, and the celebrated Villa Capra, of which there is a much more substantial copy by the excellent English architect Colen Campbell, called Mereworth House, in the county of Kent. This small work, makes one wish, that all the other remaining edifices of this accomplished architect, were illustrated in a similar manner; for those who cannot discriminate between *design* and book-embellishment, are not from either the Italian or the English editions of Palladio's architecture, alive to the exquisite beauties of Palladio's *composition*.

92. ATWOOD'S (G. Esq. F.R.S.) "*Dissertation on the Construction and Properties of Arches.*" London, A.D. 1801, and "*Supplement to a Tract, entitled A Treatise on the Construction and Properties of Arches, published in the year* 1801, *and containing Propositions for determining the Weights of the several Sections which constitute an Arch, inferred from the Angles. Also containing a Demonstration of the Angles of the several Sections, when they are inferred from the weights thereof. To which is added, a Description of Original Experiments to verify and illustrate the principles in this treatise. With Occasional Remarks on the construction of an Iron Bridge of one arch, proposed to be erected over the River Thames at London.*"—London, A.D. 1804. In examining the nature of arches, and in experimenting upon them, these tracts will be found to merit notice. Mr. Atwood is of opinion, that the voussoirs of arches may be brought to equilibrium, with both their soffits and their extrados of any form; he teaches that



the voussoirs of an arch, may be made relatively of such weight, and with such an adjustment, that they shall severally bear with the same gravity to one common centre; the adjoining wood cut exhibits two different forms, in which the voussoirs are all adjusted so as to be in equilibrium. Mr. Atwood states, that the arch-joints are not of necessity obliged to proceed at right-angles from the intrados, but that by adjusting the angles of the arch-joints the voussoirs of arches may be made by their friction to compensate for their irregularity of weight; he also states, that the current opinion, that a true arch of equilibrium is an inverted catenary, is neither founded on mathematical nor on experimental investigation.

93. BARLOW's (Peter, F.R.S.) "*Essay on the Strength and Stress of Timber, "founded upon experiments performed at the Royal Military Academy, on specimens "selected from the Royal Arsenal and his Majesty's Dock-yard, Woolwich: preceded "by an Historical Review of Former Theories and Experiments; with numerous tables "and plates. Also an Appendix on the Strength of Iron and other Materials.*"—London. The acknowledged value of this work, needs no reiteration; from experimental research, we can alone look for certainty in practical science. The work contains some observations upon "*Revêtements,*" or Embankment-walls, a subject hitherto not much developed, but which Dr. Alex. Jamieson has pursued in his new works.—See also Bullet on the same subject.

94. BELIDOR's (M.) "*Science des Ingénieurs dans la conduite des travaux "de Fortification et d'Architecture Civile.*"—Paris, A.D. 1739. This work is well worth possessing; it contains many useful observations of a practical nature, and the author gives something like detailed specifications for military works, but they are only for such as are to be paid for by admeasurement.

95. BELZONI's (G.) "*Narrative of the Operations and Recent Discoveries, "within the pyramids, temples, tombs, and excavations, in Egypt and Nubia; and "of a Journey to the Coast of the Red Sea, in search of the Ancient Berenice; and "another to the Oasis of Jupiter Ammon.*"—London, A.D. 1820. This work cannot be without interest to any architect. Belzoni was of opinion, that brick arches which he met with in Egypt, were formed by the Egyptians themselves; he also in reference to Egyptian quarrying says, "It appeared "to me, by what I could observe, that the pieces of granite were procured "by cutting a line with a chisel, about two inches deep, round the stone intended "to be removed, and then by giving a great blow with some machine, which "separated the part like glass when cut with a diamond."

96. BENTHAM's (James, M.A.) "*History and Antiquities of the Conventual "and Cathedral Church of Ely, from the foundation of the Monastery, A.D. 673, "to the year* 1771," With fifty Engravings, London, A.D. 1771. This valuable work must be interesting to the architect, from its literary excellence, but the plates though good for the time at which they were engraved, certainly cannot render so much assistance to the practical architect, as correct modern engravings of such subjects.

97. BLONDEL's (Jaques-François) "*Architecture Françoise, ou Recueil des "Plans, Elévations, Coupes, et Profils, des Eglises, Maisons Royales, Palais, Hôtels, "& Edifices les plus considérables de Paris, ainsi que des Châteaux & Maisons de*

" *Plaisance situés aux environs de cette Ville, ou en d'autres endroits de la France,* " *bâtis par les plus célèbres Architectes, & mesurés exactément sur les lieux. Avec* " *la description de ces Edifices, & des dissertations utiles et intéressantes sur chaque* " *espèce de Bâtiment.*"—Paris, A.D. 1752-4. This work, contains a valuable treatise on practical building, and in particular upon foundations. A large portion of the buildings exhibited in this work, were erected at a time when the taste of French architecture was perhaps in its worst state; but the student will observe with no small admiration, the ingenuity displayed in adapting many of the plans to irregular sites, so as that their irregularities may disappear; and some of the plans are indeed very fine. The general character of the elevations does not delight; they are mostly heavy without being grand, similar without being harmonious.

98. BLORE'S (Edward, F.S.A.) " *Monumental Remains of Noble and Eminent* " *Persons, comprising the Sepulchral Antiquities of Great Britain.*"—London, A.D. 1825-6. This beautiful work, containing thirty engravings, chronologically arranged, is very valuable to the practical architect, although it is not accompanied by elevations or details; but its illustrations are made out with such delicacy and precision, that even from the perspective views, the profiles of the mouldings can be almost correctly drawn. It is to be regretted that this work is not of greater extent.

99. BOISSERÉE'S (Sulpice) " *Vues, Plans, Coupes, et Détails, de la Cathé-* " *drale de Cologne, avec des Restaurations d'après le Dessin Original, accompagnés* " *de Recherches sur l'Architecture des Anciennes Cathédrales, et de Tableaux* " *Comparatifs des Principaux Monumens.* A.D. 1821—1835." This glorious work, upon *this* glorious cathedral, representing it as it was proposed to be finished, should be possessed by every architect and amateur, who can afford to purchase so sumptuous a publication: an indelible honour to the nation which produced its author, it does not appear to have been able to save that nation from the disgrace of its author enduring the horrors of a prison, and that it is said, through the enormous and burthensome outlay requisite for so laborious and delightful a production.

100. BRITTON'S (John, F.A.S. &c.) " *Architectural Antiquities of Great Britain.*"—London, A.D. 1807—1826. This work, with its numerous engravings, is one of the most valuable and esteemed works ever published: from its extent and from the gradual improvement in architectural engraving, there is considerable difference in the excellence of the embellishments of it: the fifth and last volume of the work, which contains a chronological history of Church Architecture, illustrated by 86 engravings, a chronological list of founders architects and edifices, and a glossary of terms relating to ecclesiastical buildings of the middle ages, is one of the most masterly and valuable elementary treatises upon the subject, which has ever appeared, and in it are contained many theories by other antiquaries.

101. BRITTON'S (John, F.A.S.) " *Histories and Antiquities of the Cathedral* " *Churches of England.*" London, A.D. 1814—1835: of which the following separate parts are those which have been published:

Salisbury	A.D. 1814.	—31 Engravings.
Norwich	A.D. 1816.	—25 Engravings.
Winchester	A.D. 1817.	—30 Engravings.
York	A.D. 1819.	—34 Engravings.
Lichfield	A.D. 1820.	—16 Engravings.
Canterbury	A.D. 1821.	—26 Engravings.
Oxford	A.D. 1821.	—11 Engravings.
Wells	A.D. 1824.	—24 Engravings.
Bath	A.D. 1825.	—10 Engravings.
Exeter	A.D. 1827.	—22 Engravings.

Peterborough	A.D. 1828.—16 Engravings.
Gloucester	A.D. 1829.—22 Engravings.
Bristol	A.D. 1830.—12 Engravings.
Hereford	A.D. 1831.—16 Engravings.
Worcester	A.D. 1835.—16 Engravings.

This admirable series of works, will remain a lasting monument, of the taste industry and patriotic feeling of this immortal antiquary :—it is to be regretted, that the remainder of our Cathedral Collegiate and Abbatal Churches, have not been treated of in a similar manner: the enormous expense of forming this National Work, of which foreigners may well be jealous, appears to have deterred the author from proceeding :—the blank is in some sort supplied, by the Publication of Wild upon Lincoln Cathedral; those of Bentham, Millers and Storer upon Ely Cathedral; those of the London Society of Antiquaries upon Durham Cathedral and St. Alban's Abbey; those of Storer upon the Cathedrals of Chester, Carlisle, Chichester, Rochester, Llandaff, Bangor, St. David's and St. Asaph's; and by that of Neale and Brayley upon Westminster Abbey; but few of these, except those of the Society of Antiquaries and by Wild, are treated of in a manner to advance the knowledge of *Practical* Architecture.

It is also to be regretted, that from a fear of not receiving return sufficient for the great outlay, Britton and his publishers, have been deterred from giving more Sections, Elevations, and Details at Large, of the fine subjects of their labors :—vast benefit would be conferred upon Architectural Art in those departments of knowledge, by the publication of a supplementary part upon each Cathedral, containing those desirable particulars, and affording Crockets, Pinnacles, Archivolts, Tracery, and other peculiar architectural members, and accompanied by a more minutely scientific description.

102. Britton's (John, F.S.A.) "*Dictionary of the Architecture and Archæology of the Middle Ages; including the Words used by Old and Modern Authors in treating of Architectural and other Antiquities: with Etymology, Definition, Description, and Historical Elucidation. Also Biographical Notices of Ancient Architects.*" London, 1830 —— The worth of this work is greatly enhanced by the engravings of it, containing classed specimens of existing members of Romanesque or Saxon, and of Gothic architecture.

103. Britton (John) and Augustus Pugin's "*Illustrations of the Public Buildings of London,*" With 144 beautiful Engravings.—London, A.D. 1823—1828. Perhaps there never has been published in any country, another work upon existing modern buildings, so valuable as this. It is true, that from the small size of the engravings, many of the larger buildings are cramped in their details; but this is of the less consequence, from most architects possessing an abundance of prints, books, and drawings, upon that branch of practical art; the lustre of the work is only tarnished by the literary department of it, being written by several different persons, so as to be in some respects a contradictory republic; and it would have been well, if some of the minor subjects, which are neither meritorious in design nor execution, should not have usurped the place of admirable buildings of importance, which have not hitherto been architecturally represented. Before a reprint, some of the plates should be examined, and their architectural errors should be corrected; thus from this circumstance, should be corrected the breaks in the entablatures of the campaniles and of the entablatures of the façade of St. Paul's Cathedral, which from their intricacy (though of the simplest possible general form) seem hitherto almost to have defied correct representation; nearly all the prints of this Cathedral, hitherto published, would have offended the picturesque and mathematical eye of Wren. It would confer an inestimable benefit upon society, if all the other best public buildings of the

British dominions, were delineated in manner to correspond with the volumes o this admirable work.

104. BULLET'S (Pierre) "*Architecture Pratique, qui comprend le détail d* "*Toisé, et du Devis des Ouvrages de Massonnerie, Charpenterie, Menuiserie, Serrurerie* "*Plomberie, Vitrerie, Ardoise, Tuille, Pavé de Grais, & Impression. Avec une expli* "*cation de la Coutume sur le Titre des Servitudes & Rapports qui regardent les Basti* "*ments. Ouvrage tres-necessaire aux Architectes, aux Experts, et à tous ceux qu* "*veulent bastir.*"—Paris, A.D. 1691. This small octavo volume, is of very rar merit; exact wise and systematic, it is indeed from those qualities, a very severe censor of all bad building: this work did not fall into the author's hands till h had almost completed this present undertaking: some extracts from Bullet's volum will be found in this work, for which see the Index. The discerning Frenchman seems to have gleaned from various sources, most of the best precepts upo *Practical Building;* and aided by a very clear judgment, and great practice experience, he has produced a volume of small size, which alone would almos teach any one who is not obstinate or prejudiced, how to build wisely and sub stantially, although previously unacquainted with practical building. Bullet wen with considerable success, into the subject of Rampart Walls, or "*Revêtements*, the knowledge of which seems from his time to have remained almost stationary till the recent consideration of the subject by our own Civil Engineers and Ma thematicians. Bullet's extracts from the old French law, relative to building and the regulations with regard to them between party and party, are generall founded upon just principles, and some of them seem to have formed models fo provisions in the London Building-act.

105. BURLINGTON (Richard, Earl of)—*see Andrea Palladio.*

106. CAMPBELL'S (Colen) "*Vitruvius Britannicus, or the British Architec* "*containing the Plans Elevations and Sections of the Regular Buildings, both Publi* "*and Private, in Great Britain, with variety of New Designs; in* 200 *large Fol* "*Plates, Engraved by the best Hands; and Drawn either from the Buildings them* "*selves, or the Original Design of the Architects.*" This admirable work, contain a large collection of delineations of some of the most celebrated modern building of England; very few of the edifices delineated in it, are of inferior merit; amon others, it contains Whitehall Palace, Greenwich Hospital, Castle Howard, Blenheim House, St. Paul's Cathedral, St. Peter's Church at Rome; also Wanstead House Mereworth Castle, and some other buildings erected by the talented author o the work.

In continuation of Campbell's work, two other excellent volumes containin 200 plates, have been added by John Woolfe and James Gandon, London, A.D 1767—1771; and two other subsequent volumes have been put forth under th title of "*The New Vitruvius Britannicus, consisting of Plans and Elevations o* "*Modern Buildings, Public and Private, Erected in Great Britain by the mos* "*Celebrated Architects.*" Engraved on 142 Plates by Geo. Richardson.—Londo 1802—1808; but it must be confessed, that these latter two volumes are not of ver high value, on account of most of the buildings delineated in them, having bee erected at an era when architecture had become mean and dry, from an almos total disuse of the more ancient style of rich and bold decoration; while some o the designs by Joseph Bonomi, with Porticos having the deformity of a centra column, are worthy of the severest reprehension; but it must also be confessed that many of the plans given in these volumes, exhibit great regularity an ingenuity.

Other supplementary volumes, by the talented Mr. P. F. Robinson, with mos exquisite engravings are now being added to the former series of works: thi latter fine work (which is indeed quite a new undertaking) it is to be hoped, wil contain delineations of the Chapel of Greenwich Hospital, Shoreditch Church and Spitalfields' Church, (the interior of which last is perhaps the grandes

of modern parochial churches), and in general, delineations of such others of our national buildings as are eminent for beauty or for grandeur, although they may contain some faults.

107. CARTER'S (John) "*Ancient Architecture of England.*" London, A.D. 1795-1814. This work contains a vast fund of Gothic Architecture and Antiquarian lore; the subjects of it are boldly, though roughly engraved, but with the aid of modern sections and details, are of invaluable assistance to the architect. A new edition of this work has just been published, with additional notes by Mr. Britton.

108. Extremely valuable also is the late Mr. Carter's work, entitled "*Specimens of the Ancient Sculpture and Painting now remaining in this Kingdom, from the earliest period to the reign of Henry ye VIII. consisting of Statues, Basso relievos, Brasses, &c. Paintings on Glass and on Walls, &c.*" London, A.D. 1780—1794.

109. CAVELER'S (William) "*Select Specimens of Gothic Architecture.*"—London, A.D. 1835-6. This work contains seventy-four Engravings, some of which are excellent; and though some of them are of less merit, but very few antiquarian delineators, have ever in their art *begun* better.

110. CAYLUS'S (Anne-Claude-Philippe de Thubières, &c. Comte de) "*Recueil d'Antiquités Egyptiennes, Etrusques, Grecques, Romaines, et Gauloises.*" 7 vol.—Paris, A.D. 1752-1767. This work, though partly superseded by those giving more recent discoveries, and by those with better illustrations, is nevertheless a very valuable collection of information: in the sixth volume of it, is a representation of a most curious circular building attached as a kind of vestibule to the parochial church of Lantef, in the diocese of St. Brieux, near Pontrieux, in France: it is of stone, containing in its outer circumference sixteen doorways with elongated semi-circular heads; within this, there is another circular wall, containing twelve doorways covered with semi-circular arches; in the centre of the building, grows a very high and broad yew-tree: the building is 165 French feet in circumference, and the distance between the outer and the inner circular walls of it, is about six feet; the building was never roofed, and is supposed to be an ancient Gaulic remain.

111. CHAMBERS'S (Sir William) "*Designs of Chinese Buildings, Furniture, Dresses, Machines, and Utensils.*" "*To which is annexed a description of their Temples, Houses, Gardens, &c.*"—London, A.D., 1757. No architectural library, would be complete without this curious and characteristic work. The buildings of the Chinese possess a great deal of simple beauty, abstractedly considered, although so different from buildings of classical architecture; the columns of them, appear to be generally of the Ionic proportion, with bases frequently resembling those of the Attic form,—but are without capitals, or have brackets springing from their heads, not unlike some of the columns of India, and some of those in Egypt or even of Delos; their houses are by no means ill-arranged, and being low, very much resemble those of Pompeii; the courts of their temples, with the surrounding buildings, are laid out with great symmetry and imposing effect; while their lofty pyramidal pagodas, are formed with outlines on principles undeniably picturesque; and as every mode and custom connected with China, is believed to rest on such high antiquity, it is not improbable, that the Christians may have derived their steeples and spires from the same common origin as the Chinese have their pagodas, if indeed pagodas be not of origin older than all other conical towers,—for it does not appear, that there are in existence, any other ancient lofty buildings, of a pyramidal, conical, or spiral proportion, except the solid pyramids and obelisks of Egypt, for the Moslem minarets appear to be of comparatively modern date.

112. It is to be observed, however, that Chambers represents the apertures in Pagodas with semicircular arches; but as he did not view any other Chinese city besides Canton, there is no proof that the pointed arch may not be as prevalent in China as in the rest of Asia.

113. The following remarks, relative to the practical building of China, are taken from the eleventh page of Chambers's work: "The materials they build with "are of wood and brick; the latter being sometimes dried in the sun only, and "sometimes burnt. The walls of their houses are generally about eighteen inches "thick. Their bricks are about the size of ours, and their manner of walling is "this: on the foundation they lay three or four ranges of brick, entirely solid; "after which they dispose their bricks on the two faces of the wall, frontways "and lengthways alternately, in such manner, that the front ones meet and occupy "the whole breadth; but between those that are disposed lengthways, there re- "mains a void space in the middle of the wall. On this first range they lay a "second, disposing all the bricks lengthways, and observing to cover the joints of "the front bricks in the front range, with a whole brick in the second; and so "they proceed alternately from the bottom to the top. By this means the ex- "pense both of labour and materials is considerably diminished, and the weight "of the wall much lessened."

114. "The roofs are covered with flat and semi-cylindrical tiles, the latter "being placed over the joints of the former, and supported in the manner repre- "sented, Plate XII. Like the Goths, they always leave the timber-work of the "roof exposed within side, and often make both it, and the columns that support "it, of precious woods; sometimes enriching them with ornaments of *inlaid ivory* "*brass and mother of pearl*."

115. Thus it appears, the Chinese (time-out-of-mind, as far as we know) have been in the habit of making hollow walls; which method, has been within a few years practised in England, as a new invention for saving materials, and for the partial prevention of saturation; nor may the method be altogether bad for low walls like those of Chinese houses.

116. Again, it appears that the Chinese form their roof-tiles, in the same manner as the Italians do at this day, and as the Greeks did 2000 years ago of marble.

117. CHAMBERS'S (Sir William) "*Treatise on the Decorative part of Civil "Architecture.*"—3rd Edition, London, A.D. 1791. This work, is extremely valuable, from containing the practical knowledge of so accomplished an architect as the builder of Somerset House, London: it contains some most valuable opinions, relative to the *composition* of architecture of which he was so unrivalled a master: in the work are also some severe remarks upon *Grecian* architecture, which Chambers could not admire; at which one cannot much wonder, since he scarcely saw its beauties, except through the slovenly libel upon the subject by the Frenchman Le Roy, to whom indeed Stuart gave the merited chastisement: there are republications of this work, both by Gwilt and Papworth. The grandeur, proportion, and graceful simplicity, of the architecture of this successful artist, show that he was intuitively a genuine lover of Grecian art, however concealed to himself was the consciousness of it.

118. CHAMBRAY'S (Roland Freart, Sieur de)—"*Parallèle*"—*See* FREART. § 147.

119. CHANDLER'S (R.) N. REVETT and W. PARS. "*Ionian Antiquities, pub- "lished with permission of the Society of Dilettanti.*"—London, A.D. 1769. And part the second of the same work, "*published by the Society of Dilettanti.*"—London, A.D. 1797. These invaluable works, ought to be in the hands of every architect: no other remains, exhibit the Ionic Order, in such majestic but lovely purity: the mean English copies of this *true* Ionic Order, in coarse discoloured stone or tattered plaster, and deprived of its exquisite enrichments, give rather a distaste for ancient art: the bare possession of these works, which contain delineations of buildings, which have been more than 2000 years decaying, and are not yet all gone, is enough to impart to the amateur, the architect, and the gen- [illegible], a high relish for ancient art in its purity: the remains of the Athenian [illegible] ecture, though exquisitely beautiful, afford but a faint shadow of what [illegible] ave been the excellence, grandeur, and purity of the Ionic Order in its

own country. Many heaps of stone still remain in Asia Minor, which, with the expense of moving, would re-develop a surprising deal of ancient beauty.

120. CHAPUY'S (————) "*Vues Pittoresques de la Cathédrale d'Auxerre, "et Détails Remarquables de ce Monument; avec un Texte Historique et Descriptif "par F. T. De Jolimont.*"—Paris, A.D. 1828. Similar works have been published by the same artist and the same author, upon the Cathedrals of *Albi, Amiens, Arles, Autun, Chartres, Dijon, Orléans, Paris, Reims, Senlis,* and *Sens,* and one upon the Cathedral of *Strasbourg,* with the text by *J. G. Schweighæuser.*

These works, which have been undertaken something on the same plan as Britton's Cathedrals, are useful from our not possessing any better works on the same subjects; but the prints of them not being numerous, and being only executed in lithography, and that not of the best, are in merit infinitely beneath our own graphic works on the Cathedrals of Great Britain, and Boisserée's superb work upon the Cathedral of Cologne:—though we must take such works as these till we are provided with better, yet we cannot help lamenting how little art is advanced by works of this character. Perhaps if the English antiquarians had not set about the correct *Geometrical* delineation of the monuments of the middle ages, there would not as yet have been the slightest successful correct imitation, in work, of the exquisite Pointed Architecture.

121. COLLIE'S (James) "*Plans, Elevations, Sections, Details, and Views of "the Cathedral of Glasgow.*"—A.D. 1835-6. This meritorious work, comprising thirty-four folio plates, with admeasurements, is an excellent commencement of scientific delineations of the Gothic buildings of North Britain; and although only in lithography, from the excellence of the performance, suffers little from that circumstance.

122. CONEY'S (John) "*Engravings of Ancient Cathedrals, Hotels de Ville, "and Other Public Buildings of Celebrity, in France, Holland, Germany and Italy.*" London, A.D. 1829-1832. This magnificent work, though of very little use to the practical architect as a text-book, is however highly valuable to him, for its perspective and picturesque massing of the grand subjects of its illustrations.

123. COTMAN'S (John Sell) "*Architectural Antiquities of Normandy.*"—London, A.D. 1819-1822. This work is very useful, from its spirited etchings, and for the literary part of it by Dawson Turner, Esq. It shews the gradual development of architecture during the middle ages: it would have been much more valuable, if accompanied by numerous plans, elevations, sections and details; but Pugin and Le Keux's work upon the same subject, removes in some instances this want:—the latter mode of delineation, is too dry and tedious for most artists and antiquaries; hence the careless and unskilful, endeavouring to put into work that for which they have no minute particulars, produce only wretched parodies of the most admirable proto-types. Beautiful also are the following other works by Mr. Cotman:—"*Etchings by John Sell Cotman,*" London, A.D. 1811; consisting of twenty-four plates, many of which are from very fine architectural fragmental subjects.—"*Antiquities of Saint Mary's Chapel, at Stourbridge, near Cambridge,*" Yarmouth, A.D. 1819. This work contains six plates, besides two plates of views of Cambridge Castle, and two plates shewing the "*Monks' Entrance,*" and the exquisite "*Priors' Entrance*" at Ely Cathedral.—Also, "*Series of Etchings illustrative of Architectural Antiquities of Norfolk, with references to the Authors who have Described or Figured them.*"—London, A.D. 1818; containing 60 plates.

124. COTTINGHAM'S (Lewis Nockalls) "*Plans, Elevations, Sections, Details "and Views of the Magnificent Chapel of King Henry the Seventh at Westminster "Abbey Church; with the History of its Foundation, and an Authentic Account of "its Restoration.*"—London, A.D. 1822-9. This publication is valuable, from giving representations of the super-human Chapel as restored; and though it is generally admitted, that some portions of the work are not exact restorations of

the former decayed work; yet from the impossibility of a real restoration of those parts, no antiquarian quarrel should be entertained on that account:—the elevations, sections, and details of Westminster Hall, by the same author, are in execution very similar to those of Henry the Seventh's Chapel:—it is to be regretted, that these two works, upon such beautiful and important buildings, have not the elegance of engravings upon copper or steel: one does not like the embellishments of a valuable work of history and of reference, to be executed in an inferior branch of art.

125. Cresy (Edward) and G. L. Taylor's "*Architecture of the Middle Ages in Italy: illustrated by Views, Plans, Elevations, Sections, and Details, of the Cathedral, Baptistery, Leaning Tower or Campanile, and Campo Santo at Pisa.*" London, A.D. 1829. This work, practically considered, is highly valuable and curious, from showing the manner in which the Campanile, from excellent union of masonry, still subsists, notwithstanding the prodigious failure of its foundation, and for its exhibition of the early use of the Conical Dome, which with such successful and unrivalled geometrical skill, is inserted between the internal and the external cupolas of St. Paul's Cathedral at London, and although it is generally believed, that Wren possessed no knowledge of any proto-type:—besides the practical use of this work, it is also of inappreciably high archæological merit, from the peculiar chronological points of architecture which it illustrates. On this subject see also *Archaeologia, Vol.* xx. *for the "Remarks" by Arthur Taylor, Esq.* Any one who is acquainted with the internal construction of the Dome of St. Paul's, and who has seen the external form of the old College of Physicians, in Warwick Lane, London, can scarcely believe that Wren was unacquainted with the Baptistery of Pisa.

126. Cresy (Mrs.)—*See* "Milizia." § 183.

127. Curabelle (Jacques)—*See* De La Rue. § 232.

128. Dallaway's (the Rev. James) "*Series of Discourses upon Architecture in England, from the Norman Æra to the close of the reign of Queen Elizabeth, with an Appendix of Notes and Illustrations, and an Historical Account of Master and Free Masons.*"—London. This valuable work, should be in the hands of every professional and amateur architect;—an early work, since the revival of Gothic architecture, it is still one of the best extant on its particular subjects. The last edition of A.D. 1833, with much extra information, has been printed, however, with too little care: a carefully edited new edition of it, with sufficient engravings, would obtain ready circulation.

129. Daniell's (Thomas) "Oriental Scenery. *Twenty-four Views in Hindoostan, Drawn and Engraved by Thomas Daniell, and with permission respectfully Dedicated to the Honourable Court of Directors of the East India Company. London, March* 1, 1795."—"Oriental Scenery. *Twenty-four Views in Hindoostan, from the Drawings of Thomas Daniell, Engraved by himself and William Daniell, and with permission, respectfully dedicated to the Right Honourable Henry Dundas, one of His Majesty's Principal Secretaries of State, President of the Board of Commissioners for the Affairs of India, Treasurer of the Navy, &c. &c.—London, August,* 1797." "Antiquities of India. *Twelve Views from the Drawings of Thomas Daniell,* R.A. & F.S.A., *Engraved by himself and William Daniell, Dedicated respectfully to the Society of Antiquaries of London.—London, October* 15, 1799:" with a short description in 8vo. This fine series of works, containing sixty Engravings, is somewhat scarce: it is sufficient to awaken in the mind of the anxious architectural inquirer, the strongest possible desire to be acquainted with the minute particulars of Gothic Architecture in its Indian modifications.

130. Davis's (Edward) "*Gothic Ornaments, illustrative of Prior Bird's Oratory, in the Abbey Church of Bath.*"—London, A.D. 1834. This work, which is illustrated by twelve most exquisite delineations in lithography, is

highly valuable for the large scale of the plates, and for the bold and elegant finish both of the ornaments themselves and of their delineations.

131. De L'Orme's (Philibert) "*Architecture.*" Paris, A.D. 1568; and *Nouvelles "Inventions pour bien Bastir et a petits fraiz, trouvees n'agueres.*" Paris, A.D. 1561. These antiquated French practical works, are both still valuable, and may be consulted with advantage. De L'Orme's "*New Inventions*" consist principally of the application to ceilings and cupolas, of curved ribs, formed of short lengths of timber in two thicknesses, with their joints crossed against each other, and with cross struts keyed and wedged at intervals between the ribs; but it must be confessed, that it would be infinitely better and more profitable to revive, the method of vaulting and doming with incombustible materials.

132. The reader can hardly refrain from being pleased and from smiling at the courtly artist's singular mixture of humility and of self-consideration, of humour, and of affected gravity, in the perusal of De L'Orme's "*Epistre av Lectevr*," from which is taken the following extract:—

"Cognoissant fort bien qu'il n'y aura que trois personnes qui parleront de "moy, & uoudront iuger de ceste Inuention: mes amis, qui en diront bien pour "l'affection qu'ilz me portent: les ignorants, qui en parleront aussi tost bien que "mal, & mettront plusieurs, mais cecy, mais cela: & ceux qui me portent enuie, "qui en dirõt ce qu'ilz uoudront, cõme quereleux, & malicieux, qui ueulent les "paroles par poix & par mesure. I'espere que les hõmes uertueux, bons, & "pacifiques, qui sçauent considerer & priser le bien, trouueront mon intention & "inuention bonne: & à tels i'addresse mes escripts, & non aux detracteurs qui "ne sçauent que mesdire, & rien faire d'importance ou d'honneur. Les œuures "que i'ay commandé & ordonné faire depuis l'eage de quinze ans iusques icy, "soubz diuerses sortes & façons par uray art d'Architecture, ie ne diray en ce "Royaume, mais aussi en plusieurs autres, parleront suffisamment pour moy, & "laisseront ample tesmoignage de mes capacitez, sçauoir & artifice. Ce que ie "dy non par iactance, ains plustost pour en rendre glorie & honneur à Dieu, "autheur de tous biens, toutes uertus, toutes graces, & tous dons de perfection "& excellence, ainsi qu'escriuent les Apostres, sainct Paul and sainct Jacques: "& ne ueux icy oblier que mon labeur & estude a tousiours tẽdu à ce but & "fin de pouuoir faire quelque aggreable seruice à mon souuerain Roy, Princes & "Seigneurs, de ce Royaume, & generalement à toute ma patrie, laquelle surpasse "toutes amitiez, & doit estre à un chacun comme pere & parent: ainsi qu' "apres Ciceron escrit sainct Augustin. Et iaçoit que communement on ne soit "prisé & estimé en sa patrie, comme tesmoigne Iesuchrist en son Euangile, ie "n'ay pour-ce delaissé y uouloir uiure, & luy communiquer liberalement mon "industrie, et le talent que i'auois receu de Dieu, pour luy estre distribué, "comme aux autres."

133. But it does not however appear, that the "*Nouvelles Inventions*" were altogether first discovered by De L'Orme, since there exist at Venice, in the domes of the Church of St. Mark, and in the domes of other churches of that city, old specimens of much the same kind of construction; though perhaps De L'Orme was the first to apply cross struts keyed between the ribs: Rondelet states, too, that Sebastian Serlio, (the contemporary of De L'Orme), in the 41st chapter of the 7th book of his Treatise upon Architecture, having been directed by *Francis the First* to make some repairs to the palace of Tournelles, he there found some vaults more than 200 years old, which were formed of ribs of boards covered with a very hard description of plastering.—See *Jean Rondelet's* "*Traité Theorétique et Pratique de l'Art de Bâtir*," vol. 3, page 145 and plate 117, where there is a representation of the construction of the Domes of St. Mark's Church at Venice.

134.—But it does not seem that *Serlio's* own words go altogether to the extent intimated by Rondelet, as may be seen by the following quotation: "Questa "sopra loggia non sarà in volta di pietra: ma se gli farà il suo cielo di legname

"bene inchiavato nel muro : nè anche quella da basso sarà sicura senza le chiani "di ferro dall'vn pilastro all' altro. Et si deono fare le volte di materia leggiera, "come saria di mattoni, ò di pomice. Et si potria anche ordire le volte di "legname, & poi smaltarle di gesso, coperto poi di buono calcina, & dipinte an- "chora. E sarà opera durabile di gran tempo. Dellaqual cosa n'ho io veduto "tre isperienze a' giorni miei. La prima fù in Bologna patria mia : che volendo "racconciare alcune camere pe'l confalconieri, trovai una camera vecchia voltata "di canne, smaltata di gesso, assai fresca & forte. Nondimeno era circa à tre- "cento anni che fu fatta. Trovai di poi in Pesaro la casa d'un cittadino, che "havea patito incendio grande : di sorte che gli ornamenti de' camini di pietra "viva erano calcinati, & in più parti crepati, and nondimeno le camere fatte in "volta di canne, & smaltate di gesso, havere fatto resistenza al fuoco. Finalmente "havendomi dato alloggiamento il Rè Francesco nelle Tornelle in Parigi, & vo- "lendomi io accommodare in alcune stanze, trovai alcune volte ordite di legname, "& coperte di gesso duro & forte, che erano di circa CC. anni. Sì ch' io assi- "curo ciascuno à fare tali opere : ma provedere solamente, che la pioggia non l' "offenda."—Serlio, lib. vii. cap. 41.

135. It must be confessed that the stiffness and lightness of domes and vaults constructed after De L'Orme's method, render them applicable in many cases, and they are very economical both of material and of the Sectional Internal Space of the Building :—they do indeed very much resemble the stone-ribbed vaultings of the Gothic architects, the plain spaces of which were so light and thin as merely to steady the ribs of the vaulting, and to form a screen-work : and although the ribs of them are from their united texture not so liable to derange by gravity as are ribs of stone, still in large works it may be a matter of some trouble or difficulty to preserve the equilibrium of their several parts. The new roof over the "*Halle au Blé*," at Paris, an immense dome constructed on De L'Orme's principle, having all round it a huge circular abutment of building, obtained its equilibrium without much trouble.

136. Denon's (Vivant) "*Voyage dans la Basse et la Haute Égypte, pendant "les Campagnes du Général Bonaparte.*" Paris, A.D. 1802. This valuable well-known publication, has been in a great measure superseded by the more magnificent French National Work upon the same subject ; but this is most likely to be possessed by the ordinary student, on account of the very great expense of the other work.

137. Desargues (————) *See* De la Rue § 232.

138. Descodetz's (Antoine) "*Edifices antiques de Rome, dessinés et mesurés "très exactement.*" Paris, A.D. 1682. This work, which resulted from an expedition liberally sent out by the French government in the reign of Louis the XIVth, is much more exact than all preceding delineations of the Roman Remains, and though it has been recently outdone by other and still more exact publications, it is still highly esteemed by all architects of intelligence. The unprecedented beauty and exactness of our modern architectural publications, would indeed wipe off the stain of our modern English building, were it not for the consideration of how many millions of specie are employed in the heaping up of materials so as to crush and destroy each other ;—and were it not for the enlivening idea, that another age will know how to appreciate the architectural industry and exactness of the Publications of the 18th and 19th centuries, we might be well content to destroy every vestige of our modern architectural literature, if by such a sacrifice, we could recover the taste and feeling which practically ennobled architecture, in her stately walkings, in times when there was scarcely any architectural literature in existence.

139. Dilettanti Society.—*See* "Chandler, &c. § 119, and Hittorff." § 154.

140. Donaldson's (Thomas Leverton) "*Examples of Doorways, &c.*" London, A.D. 1833—1836. This is a very valuable work, though from the extreme paucity of materials in classical architecture for good examples of doorways, there is

great danger of becoming mannered: the examples from the Erectheon, the Temple of Vesta at Tivoli, the Pantheon, the Piazza della Madonna Loreto, and the Gateway by Vignola, at the Orti Farnesi, and many others of the modern Italian doorways, are very beautiful.

141. DUNNAGE (H.) and C. LAVER'S "*Plans, Elevations, Sections, Details, and Views of the Great Hall of the Royal Palace of Eltham, in Kent.*"—London, A.D. 1828. This is a valuable work, containing twenty engravings, and should be in the library of every architect and antiquary; the details of it are very well expressed.

142. DURAND'S (J. N. L. Professeur d'Architecture à l'Ecole Polytechnique) "*Recueil et Parallèle des Edifices de tout genre Anciens et Modernes, Remarquables par leur Beauté, Grandeur, ou par leur Singularité, et Dessinés sur un même Échelle.*" Paris, A.D. 1801. This publication, containing ninety immense folio plates, affords a comparative view of the sizes and proportions of an abundant number of the most celebrated buildings of all countries. A work upon a similar plan, but of a more useful form, with the plates engraven in the best English style, compiled from the present increased information, and so arranged as to admit of continual addition without confusion,—such a work, undertaken by the British government, would be an honour to the nation, and would instruct and enlarge the minds of every class of amateurs and professional men. The same Professor's "*Précis de Leçons,*" with the "*Partie Graphique des Cours d'Architecture Faits à l'École Royale Polytechnique,*" may be studied with advantage for the general composition of design, apart from decoration.

143. l'EGYPT, (*Description de*) *ou Recueil des Observations et des Recherches qui ont été faites en Égypte pendant l'expédition de l'Armée Française, Publié par les Ordres de sa Majesté l'Empereur Napoléon le Grand.*" Paris, A.D. 1809—181—. This most magnificent French national work, which has very few equals, or even competitors in the world, exhibits the Egyptian architecture almost to reality, although travellers declare that no existing graphic work, even this included, can afford a just idea of the striking grandeur of the Egyptian remains: the plates of this sumptuous work, are in general excellently and effectively engraved, and some of them are beautifully coloured after the original monuments. The drawings from which the plates were engraved, are the combined labours of eighty different artists. The work is none the less interesting for containing also some delineations of the modern buildings of Egypt.

144. In the Appendix No. 1, § 3. Vol. I. p. 8. of the work, are the following observations relative to the ancient Egyptian Quarrying. (See Belzoni on the same subject § 95.) "Nous avons dit que les traces les plus nombreuses d'exploitation "sont celles des blocs qu'on a séparés des rochers auxquels ils adhéroient: pour "cette opération, on pratiquoit de petites tranchées ou rainures de deux à trois "pouces de largeur, sur autant de profondeur, et dans leur intérieur, de distance "en distance, de petites cavités propres à recevoir des coins.

"Tous ces coins, disposés sur un même ligne, devoient agir à-la-fois pour "faire éclater la pierre dans toute la longueur de l'entaille; la rainure dont j'ai "parlé, ne pouvoit avoir d'autre objet que d'assurer davantage la rupture selon "cette direction, en diminuant la résistance et la rendant moindre dans cette "ligne que par-tout ailleurs. Souvent cette rainure manque, et les entailles "pour les coins sont à la surface même du rocher, soit qu'il importât moins alors "que la pierre suivît cette direction, soit qu'il existât des joints naturels qui "assurassent sa rupture dans ce sens; et c'est ce que l'on croit apercevoir, en "effet, dans plusieurs cas. Ces entailles pour les coins ont environ cinq "centimètres (deux pouces) de longueur sur autant de profondeur, et une largeur "de moitié moindre."

145. FERREY'S (Benjamin) "*Antiquities of the Priory of Christ-church, Hants, consisting of Plans, Sections, Elevations, Details, and Perspective Views;*

"bene inchiavato nel muro : né
"di ferro dall'vn pilastro all'
"come saria di mattoni, &
"legname, & poi smaltarlo
"chora. E sarà opera
"tre isperienze a' giorni
"racconciare alcuno
"di canne, smaltata
"cento anni che fu
"havea patito
"viva erano calcinati,
"volta di canne, &
"havendomi
"lendomi io
"& coperte
"curo ciascuno
"offenda."—

of the Priory Church;
and Borough. The literary
engravings. London, A.D.
engravings of Gothic archi-
extent, is a beautiful publication,
tecture, is both historically and
increased by additional geometrical
encouraged, the more will art in
labour under an unusual depression
BUILDING, yet perhaps the next
architecture executed in the nine-
patriotic, useful, and elegant industry,
tions, the fac-similes of architectural
in the next century be lost even from
too numerous nor too exact.

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M.A., F.S.A.) "*Foreign Topography; or,*
ally Arranged, of the Ancient Remains in
Sequel to the Encyclopædia of Antiquities."
is a compendium very useful to a student in
knowledge, and indeed it forms a worthy continu-
ation to "*Encyclopædia of Antiquities, and Elements of*
Architecture." London, A.D. 1825.

Sieur de Chambray) "*Parallèle de l'Architecture*
un recueil des Dix Principaux Autheurs qui ont
Vitruve, Palladio et Scamozzi, Serlio et Vignola, D. Barbaro
Philander, Bullant et De Lorme." Paris, A.D. 1650. Few
merit as this work, have ever appeared in the
this work alone, would revive classical architecture,
that of the ancients themselves: few works are
more just: written in a spirit of purity, although the
vantage of knowing the beauty and excellence of Gre-
Je voudrois s'il estoit possible remonter jusqu'à la source
images et les idées toutes pures de ces admirables maistres,
apprendre l'usage de leur propre bouche, parce que
dérobu à mesure qu'ils sont allez s'éloignant de leur
transplantez chez les estrangers, où ils ont degeneré
à peine reconnoissables à leurs autheurs. Car à
raison de nommer encore Dorique, Ionique, & Corin-
mal-traittez et défigurez qu'ils sont tous les jours
reste-t-il un seul membre qui n'ait receu quelque altera-
the least merit of this justly celebrated work, that it contains
examples, which for truth and accuracy, will last as
communicated by pen or print. It may be objected that
measured with that accuracy which is necessary; no
that age, men were less scrupulous in copying the works
to give to the best of their taste, the most perfect finish to
the present day, the most painful toil is endured in the exact
works, while the coarsest slovenliness is too often exhi-
and workmanship of our modern buildings. The examples
the "*Parallèle*," are indeed somewhat different from the Ro-
they were copied, but in all their differences they approach
simplicity, and beautiful proportions of the Grecian remains:
has of late been neglected; it may be bought at common
shillings; while large sums are frequently given for many a
seems only a parade of how much bad taste and want of

science could pass current. The English translation of the "*Parallele*" by Evelyn has appended to it, two valuable treatises, one of which is by Sir Henry Wotton, and the other by Evelyn himself, and a third, which is a translation of the celebrated book by L. B. Alberti, upon statues. A fine manuscript, believed to be the original copy of the "*Parallele*," is in the possession of Mr. Stutely, of John Street, Adelphi, London; it is in excellent preservation, and is embellished with drawings, many of which are most exactly and delicately delineated; it is from the library of the King of France, and on the cover of an accompanying printed copy of the same work are represented in gold the French royal arms.—It is however rather singular, that the shrewd *Sieur*, who strives to defend Alberti, even when in fault, as in the instance of the omission of a member so indispensable as the Corona of a Cornice, should condemn his favourite for bad taste in the proportions of his Doric Capital, whereas the Capital given by Alberti himself, is of very good proportion, and the one copied by Freart, in his work, is only a variety which Alberti states that he had seen among ancient buildings, which was no doubt the truth.

148. GAUTHEY'S (E. M.) "*Dissertation sur les Dégradations survenues aux "Piliers du Dôme du Panthéon François, et sur les Moyens d'y Remédier.*"—Paris, A.D. 1798. This work is well worthy of study, by those who are curious in matters relating to the failure of Domes; for besides a treatise relative to that of the church of Saint Geneviève at Paris, it also contains a particular account of the settlements and fractures in the cupola and circular peristylium of Saint Peter's Church at Rome, which had increased so much in the year 1743, as to cause serious apprehension of its total ruin. The following is quoted from the 57th page of Gauthey's work:—"Le Dôme de Saint-Pierre de Rome a eu plus de 500 "crevasses qui se sont formées dans l'espace d'un siècle avant qu'on ne les ré-"parât, et elles étoient bien plus dangereuses qu'elles ne le seroient ici, car il "paroît bien démontré que le mal provenoit de la faiblesse des contreforts; et "comme on n'a pas remédié à cette cause, il s'ensuit qu'elle pourroit bien "encore reproduire le même effet." (See also Rondelet, § 227, on the same subject.) In this work, Gauthey (p. 107), disputes Rondelet's principle, that hemispherical vaults possess no lateral thrusting power, and says, "ceci n'est "pas juste, car toutes les parties d'une vôute, excepté celles du bas que le frotte-"ment retient sur un plan incliné d'environ 18 degrés, tendent à tomber en "dedans."

149. GAUTHEY'S (Émiland-Marie, Inspecteur-Général des Ponts et Chaussées, Membre de la Légion-d'Honneur) "*Traité de la Construction des Ponts.*" 2 vols. 4to. Paris, A.D. 1809-13—and a second Edition of the same Work, Paris, A.D. 1832.

This esteemed work, should find a place in the library of every Architect and Engineer; it contains representations of all the principal known Bridges in the world; but these however, it must be admitted, are neither sufficient in scale nor accuracy; nor could one man during his whole life, himself make correct representations of all the known Bridges in the world.

150. GOURY. (Jules). *See* Owen Jones, § 170.

151. GWILT'S (Joseph) "*Rudiments of Architecture, Practical and Theore-"tical.*"—London, A.D. 1826. This small treatise is much to be esteemed; it contains something of Carpentry, which may be contrasted with that of *Tredgold*; it contains a section upon the Equilibrium of Arches, and it also contains a "Dictionary of technical terms used by Architects and Artificers."—The separate "*Treatise on the Equilibrium of Arches*," London, A.D. 1826, by the same author, will also be found very useful. The latter work, contains a design by Mr. Gwilt, with which the leading proportions of the New London Bridge agree.

152. HAGGITT'S (the Rev. John) "*Two Letters to a Fellow of the Society of "Antiquaries, on the subject of Gothic Architecture; containing a Refutation of Dr.*

"*accompanied by Historical and Descriptive Accounts of the*
"*together with some General Particulars of the Castle and Borou*
"*part by Edward Wedlake Brayley, Esq.*" with 19 engraving
1834. This work, which is illustrated by nineteen engravings
tecture, extending chronologically over a wide extent, is a be
and like all exact delineations of ancient architecture, is bo
scientifically valuable: its merit would be still increased by ad
delineations of details.—*The more such works are encouraged,*
the end advance; for although the present age may labour under
from THE ABSENCE OF THE SPIRIT FOR EXCELLENT BUILDING,
century, while it deems meanly of the English architecture
teenth century, will be grateful for that patriotic, useful,
which has preserved in graphic publications, the fac-si
beauties, which would otherwise perhaps in the next cent
memory:—such works can neither be too numerous nor t

146. FOSBROKE'S (Rev. Thomas, M.A., F.S.A.) "
"*an Encyclopedick Account, Alphabetically Arranged, o*
"*Africa, Asia, and Europe; forming a Sequel to the E*
London, A.D. 1828. This work is a compendium ve
search of general architectural knowledge, and indeed
ation to the same author's valuable "*Encyclopædia of*
"*Archæology, Classical and Mediæval.*" London, A.D.

147. FREART'S (Roland, Sieur de Chambray)
Antique, et de la Moderne: avec un recueil des Du
écrit des Cinq Ordres; sçavoir, Palladio et Scamozzi,
et Cataneo, L. B. Alberti et Viola, Bullant et De Lo
publications of so much sterling merit as this wor
world: with all others lost, this work alone, woul
in manner almost equal to that of the ancien
more severe, but none are more just: written in
Author of it had not the advantage of knowing t
cian art, yet he declares, "*Je voudrois s'il estoit*
"*des ordres, & y puiser les images et les idées tou*
"*qui les avoient inventez, & en apprendre l'usag*
"*sans doute ils ont bien décheu à me sure*
"*principe, & qu'on les a comme transplantez ch*
"*si notablement qu'ils seroient à peine reco*
"*confessér la vérité, avons-nous raison de nom*
"*thien, ces trois pauvres ordres, mal-traitte*
"*par nos ouvriers? leur reste-t-il un seul*
"*tion?*" It is not the least merit of this
a critique upon some ancient examples, whi
long as language can be communicated by p
the examples given, are not measured with
doubt this is true, for at that age, men we
of others, than in striving to give to the be
their own works: at the present day, the
representation of ancient works, while th
bited, both in the form and workmanship
given by the Author of the "*Parallèle*," ar
man works from which they were copied
towards the breadth, simplicity, and be
—this invaluable work has of late beco
book-stalls for a few shillings; while
modern work, which seems only a

Building," with 26
Encyclopædia Britannica-
by every one connected
should be accompanied
whose fame will survive
were shining lights in
an age to come. How
of Roland Freart Sieur
his work, where he says,
"extremely recommend
and without choice, to follow
and abstruse author, seeing
and to accommodate him to
chapter, "This grave Author,
of the Profession." Evelyn's
French architectural stoic's
à-la-mode and modern,
be amalgamated with the

above the Second Cataract of
and its various Inhabitants, under
the Antiquities, Arts, and His-
A.D. 1835. This work, forms
knowledge which we possess.
several specimens of arches, both
that arches both Roman and
also found in Egypt, an ellip-
words upon the subject. "The

"tomb in which the elliptical arch exists, is near the valley of the Sepulchre of "the Queens, at Thebes. It is almost filled up to the ceiling with mummies, "which occasioned great difficulty to get at the spring of the arch. It is a painted "tomb, and the roof is plastered; and over the plaster, along the centre, is a line "of hieroglyphics, containing the name of Amunoph I.; *proving* the existence "of the knowledge of the arch in Egypt, about fifteen centuries and a-half before "the Christian era." Page 352.

158. It must be observed, that the locality of these arches, affords as good an argument to those who dispute the extreme antiquity of at least some of the Egyptian remains, as of the Egyptian or Ethiopian origin of the arch, to say nothing of the little faith, which most sober-minded persons can have in the certainty of any modern interpretation of ancient Hieroglyphics; the painted plastering upon the soffit of the elliptical arch, seems at first sight, to carry proof; but it is altogether out of belief, that the Egyptians might not have continued to repair, or even to re-construct their tombs, for centuries after the Romans made universal use of the arch in *their* constructions: there is indeed, no more absolute proof, that these isolated specimens are indigenous, than that the modern restorations of our ancient Gothic edifices are original. In the absence of history, all our modern European imitative architecture, would overthrow every chronological theory which could be formed upon the subject. If the Ethiopians or the Egyptians, first discovered the use of the arch, its facility of formation, and its powerful nature, why should we find their lands spread all over with huge remains indicating nothing of the science,—while Italy, where the arch is said not to have been invented, is as it were, full of ancient arches, some of them no doubt as old at least as the more recent Egyptian works? No doubt the attempt to discover the meaning of the Hieroglyphics, is a highly praiseworthy pursuit; but before an historian of undoubted integrity, will rely upon any such interpretations, he must have proof of their truth, as good as that of the Copernician system.

159. Hutton's (Charles, LL.D. and F.R.S. &c.) "*Principles of Bridges: "containing the Mathematical Demonstration of the Properties of Arches, the "Thickness of the Piers, the Force of the Water against them, &c.; with Practical "Observations and Directions Drawn from the Whole.*" London, A.D. 1812. The Tracts forming this celebrated Treatise on Bridges, besides containing scientific Theories for the construction of Bridges of Masonry, contain also a valuable History of the earliest Bridges constructed of Iron.

160. "Institute of British Architects of London," ("*The Trans-"actions of the.*") London, A.D. 1835—1836. This work is the result of a new era in architecture: carried on with spirit and discriminating wisdom, the transactions of this society will form a valuable body of practical information.

The "*Prize Essay upon the Nature and Properties of Concrete, and its "application to Construction, up to the Present Period, by George Godwin,*" is a very talented production: perhaps the only parts which should be erased from it, are the venturesome opinions relative to extending the use of "*concrete*" to the purposes of *building above ground;* sufficient time has elapsed, between the composition and the printing of this essay, to prove by example, that a prudent man, will not heap *up* walls a second time altogether of "*concrete.*" He will not exchange masonry of good strong mortar, and good strong stone or brick, for a heap entirely of mortar, and that "*très maigre.*" A careful examination, will discover, that in every instance in which "*concrete*" walls (? ? ?) have been used, more or less of instant ruin has occurred; the lintels over the apertures of the first story, have given way before even those of the second story have been laid; and when those breaches have been repaired, they have re-appeared; and even through the solid walls, rents have instantly occurred: experience proves, that

gravel lying in a bed, and there growing as it were, without the means of flow or escape, is sufficient to support the most enormous weight of fabric; but the same gravel detached, cannot be piled up, so as to form either solid upright walls, or horizontal beams. Andrew Palladio does not describe "*La Maniera Riempiuta*" as mere spheroidal particles of gravel or sand, run together with mortar; but after describing the placing of the planks for receiving the work, his terms for the operation are, "*Empiendolo di malta e di pietre di qualunque sorte mescolate insieme.*" "*Di questa maniera si possono anco dire le mura di Napoli, cioè le antiche: le* "*quali hanno* due muri di sasso quadrato, grossi quattro piedi, *e distanti tra se* "*piedi sei.* SONO LEGATI INSIEME QUESTI MURI DA ALTRI MURI PER TRAVERSO, "*e le casse, che rimangono fra detti traversi & muri esteriori, sono sei piedi per* "*quadro,* E SONO EMPIUTE DI SASSI *e di terra.*" The truth is, all experience hitherto proves, that *walls (properly so called)* must be composed of materials, either concreted geologically (to use the expression) or hardened by a process of fire. The flint walls of the Gothic builders, are composed of imperishable materials, locked and clinched together by their bent and irregular shape.

161. The bones of him who *will* build (?!?) with un-indurated post-diluvian mud, may be concreted into lime-stone, thousands of years before nature shall choose to solidify again the sandy detritus of her hoary rocks. The more energy is used in this condemnation, for the *Plague has gone forth*, and much damage has it already done to architecture, in which *one* bad example, is always speedily *centuplicated* by the rash the roving-minded and the inexperienced.

162. Every experienced architect, who has a feeling of the dignity of his profession, and of the responsibility cast upon him, whether in public or in private work, must poignantly regret any spread of this leprosy, in Practical Architecture; for even though some portions of the composition may become well compacted, and even though they should become in the end as hard as granite itself, that will not occur till the whole fabric is shivered all over with perpendicular and slanting rents, thus

and thus and not only does the weight of the roof, of the several floors, and of the cornice, cause it to rend, but all the fatal evils of *that Constructive Error*, CROSS-STRAIN, are brought into active operation, not only by the slightest inevitable settlement or subsidence of the work, but even the mere weight of the false and treacherous material itself, produces alone more *Cross-strain* than from the want of cohesion of its ill-compacted nature it can endure: hence are multiplied a thousand times all the evils of modern Practical Architecture, so full of *Cross-strain and inherent destruction*, so that the whole pile is truly like a mound of rubble, un-artificially reared, without plumb or equipoise, or horizontal pressure, or any static or other goodness; nor can the work be considered in any manner so worthy as the rough rubble stone which is lying yet in the quarry or on the earth unappropriated, for there it may be treasured up in safety, till it shall be drawn forth by the wise, and be with sagacity brought to a good purpose, while the other has totally re-pulverised itself. *True Architecture* performs every thing with the pre-concertion of science, but this false art sets at nought all science; *she* shapes and unites every thing with a motive,—but this rends and unfashions every thing; *she* places the joints of her work where she

would have them, but this breaks work into a thousand unforeseen disunions which mar all its strength and beauty of aspect; *she by Static Wisdom makes her disconnected blocks fall together and become more firm in position and texture from the active force of gravity,*—but this, by gravity alone, destroys the very substance of itself, and introduces a countless number of evil operations, of wedging and leverage, increasing still in activity, till the whole ceases to be even a ruin. The wise Vitruvius (now slighted by the wayward modern) directs that even real stone should be tested in the weather for two years before it is used; what shall we then say for ourselves, if instead of chosen stone, we used a broken and destroyed material an indefinite time before it is re-petrified?

163. And after all, the super-structure of a Piece of Architecture (so called) formed of this vanity, even though it should not speedily perish, would from its rusty and gritty aspect, deserve no praise higher than the "Nicely sanded floor" of the Ale-house of Oliver Goldsmith's Deserted Village.

164. The other articles of principal interest in this publication, are George L. Taylor's "*Account of the Methods used in Under-pinning the long Store-house at "His Majesty's Dock Yard, Chatham, in the year* 1834."—"*Particulars of some Ex-"periments on the mode of binding Brick Construction, Made* by M. J. Brunel, *Esq.*"—"*Description of the Pavilion erected at Edinburgh for the Festival in honour of Earl "Grey, September*, 1834, by Thomas Hamilton." The admission into a scientific work, of descriptions of temporary buildings, merely erected for the purposes of political ebullition, may at first sight appear descending from just dignity, but when it is considered, that such erections, may be made subservient, to the trial of experiments upon the form arrangement and accommodation of buildings, their adaptation to seeing hearing warming and ventilation, it will be then perceived, that such articles may become of a very high character. The article entitled "*Account of the Ruins of the City of Anni, in Armenia, extracted from the Journal of "W. J. Hamilton, Esq.*" is very interesting, as is also that headed "*Some Particu-"lars relating to Manuscripts of Vitruvius, preserved in various European Libraries, "communicated by T. L. Donaldson, Esq., Honorary Secretary, Corresponding Mem-"ber of the Institute of France.*"

165. "Institution of Civil Engineers," ("*Transactions of the,*") London, A.D. 1836. The first volume of this extremely valuable work, is the commencement of one of the most excellent additions to an architectural and scientific library: besides 28 beautiful plates, many wood-cuts, an introduction containing memoirs of the most successful British Engineers, and other articles of consequence, the volume contains:—

I.—"*An Account* of the Harbour and Docks at Kingston-upon-Hull; communicated by the President, James Walker, Esq."

VIII.—"*Particulars* of the Construction of the Lary Bridge, near Plymouth;" by Mr. J. M. Rendel.

XII.—"*Description* of the plan of restoring the Arch-stones of Blackfriars' Bridge;" by Mr. James Cooper.

XV.—"*On procuring* supplies of Water for Cities and Towns, by boring;" by Mr. John Seward.

XVI.—"*Some Accounts* of several Sections through the Plastic Clay formation in the vicinity of London;" by Mr. W. Gravatt.

XVIII.—"*Description* of the Method of Roofing, in use in Southern Concan, in the East Indies;" by Lieut. Francis Outram.

This paper will be read with great satisfaction, by those who deem incombustible roofs desirable.

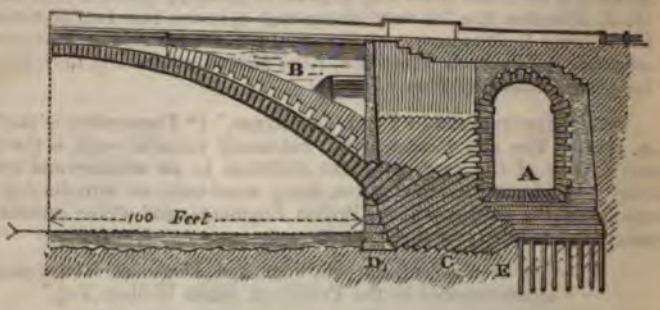
XX.—" *An Elementary Illustration* of the Principles of Tension, and of the resistance of Bodies to being torn asunder in the Direction of their Length ;" by the late T. Tredgold. *This is a very valuable paper.*

XXI.—" *Details* of the Construction of a Stone Bridge erected over the *Dora Riparia*, near Turin, by Chevalier Mosca, Engineer and Architect to the King of Sardinia." *This fine structure is built of granite, and consists of one arch* 147 *feet* 8 *inches span, and* 18 *feet rise.*

XXII.—" *Memoir* on the use of Cast-Iron in Piling, particularly at Brunswick Wharf, Blackwall ;" by M. A. Borthwick, Esq. This paper is very valuable, from its giving accounts and representations of the various forms which have been made use of in different works of iron piling ; but the lover of good and durable construction, will severely lament that this otherwise useful process, from the rapid softening and decomposition of the metal, is of no permanent value : it is, however, to be hoped that some process may be invented for counteracting the injurious effect of water upon iron.

XXIII.—" *An Account* of the New or Grosvenor Bridge over the River Dee, at Chester."

This stupendous structure, consists of one arch 200 feet span, and 42 feet rise ; it was originally designed by the late Mr. Harrison, and was erected under the direction of Mr. John B. Hartley : an examination of the section of this bridge, will shew that the engineer has wisely, from the very foundation of the work, radiated the masonry of the abutments, so as to form parts of the arch itself, and thus make the work more secure, by rendering the real versed-sine of the curve



A. Land Arch.
B. Spandril filled in with open masonry, consisting of Gothic arches concealed from view.
C. Abutment upon the solid rock, forming part of the great arch itself.
D. Face-work of masonry, before the abutment.
E. Wood-piling, rendered necessary at one end of the Bridge, by the abrupt descent of the rock.

much greater. From neglecting this principle of construction, many of our finest works have much of their strength thrown away,—*more pains seeming to be taken, in the idle experiment, of how flat a great arch may be made, without absolutely falling, instead of how the materials of it may be utterly prevented from falling ;* as if the same principle by which an arch of 3 feet span, were not equally applicable to an arch of 3000 feet span,—*the care requisite in the execution of the work being increased with the dimensions.*

XXVII.—"*Remarks* on Herm Granite, by Frederick C. Lukis, Esq., of Guernsey, in reply to Inquiries from the President; with some experiments made by the latter, on the wear of different granites." "Also experiments on the force required to fracture and crush stones; made by Messrs. Bramah and Sons."

166. INSTITUTO DI CORRISPONDENZA ARCHEOLOGICA ("*Monumenti Inediti "Pubblicati dall'*) *sotto la direzione dei Signori Od. Gerhard e Teod. Panofka.* "MONUMENS INEDITS, *Publiés par l'Institut de Correspondance Archéologique, sous "la direction de MM. Od. Gerhard et Th. Panofka.*"—Rome and Paris, A.D. 1829—33. This work, contains delineations of many interesting discoveries connected with architecture, particularly of Etruscan remains.

167. INWOOD'S (Henry William, F.S.A.) "*Erectheion at Athens, Fragments "of Athenian Architecture, and a few remains in Attica Megara and Epirus; illus-"trated with outline plates, and a Descriptive Historical View, combining also under "the divisions, Cadmeia, Homeros, and Herodotus, the Origin of Temples and of "Grecian Art of the periods preceding.*"—London, A.D. 1827. This is a valuable and interesting work, and should be possessed by every architect.

168. JAMIESON'S (Alexander, LL.D.) "*Mechanics for Practical Men.*" This work is now in the course of publication, and from the known ability of its learned and scientific author, it will prove a very valuable assistant to all connected with the execution of architecture. The following are the heads of the subjects treated of in this work: "Statics, Dynamics, Hydrostatics, Hydraulics, "Pneumatics, the Pressure and Tension of Cords, the Equilibrated Polygon, the "Catenarian, Curve, and Suspension Bridges, the Equilibrium of Arches, and "the Stability of Piers, the Construction of Oblique or Skewed Arches, the "Equilibrium of Domes and Vaults, Revêtements, &c. The strength of mate-"rials, whether of wood or iron, &c." The same gentleman is also publishing another work upon the "*Mechanics of Fluids, composing Hydrodynamics and "Hydraulic Architecture.*"

169. JONES'S (Inigo) "*Designs consisting of Plans and Elevations for Public "and Private Buildings,*" *published by Wm. Kent.* London, A.D. 1727. This work, is another singular instance of how art suddenly comes to comparative perfection. Classical architecture in Greece and Ionia, soon arrived at greater perfection and purity, than it ever assumed in any other country:—the earliest classical architects of modern Italy, practised their art, with a thousand times greater nobleness simplicity and perfection, than have any subsequent modern Italians;—Bramante, Alberti, San Micheli, Raffaello, and Palladio, have out-soared all their modern competitors:—so Inigo Jones, an apostle in architecture, rose when the most abject corruption had seized upon it; his pure mind, his noble and correct taste, lifted him at once to the very summit of his art; he at once imbibed all the purity of Palladio, with a grandeur and sublimity to which his master never arrived;—it will ever remain an honour to the unfortunate Charles the First, that he knew how to appreciate such an architect;—it is universally admitted in all countries, that Whitehall Palace, as designed by this accomplished master, would, if finished, have surpassed in grandeur, magnificence, and beauty, all other palaces, ancient or modern;—no doubt, had Jones been acquainted with the delicacies of Grecian art, his inventive but chaste talent, would have surpassed itself: but designed as it was, if ever the British monarchs really wish to have a Palace worthy of the nation, nothing to their wants could be suited better than the Design of Jones; fear should even be entertained of making any improvements, lest corruptions be introduced: it is generally admitted, that the world contains nothing so original, so grand, and so beautiful, as the Circular Persian Court designed by Jones for the palace of

Whitehall. The Italian, Milizia, says of this great architect, "*Egli si formò in* "*Architettura un gusto sì puro, che non vi è finora stato Architetto a lui superiore.* "*Il suo eguale è stato il Palladio,*" (vol. ii. p. 177, 3rd edition.)

170. Jones (Owen) and Jules Goury's, "*Plans, Elevations, and Sec-* "*tions of the Alhambra, with the Elaborate Details of this Beautiful Specimen of* "*Moorish Architecture, from drawings taken on the spot in the year* 1834." London, A.D. 1836. This most exquisite work, with painfully elaborate illustrations, engraved upon plates of zinc and upon stone, finely printed in colours, and in some instances in gold, so as exactly to represent the originals, is now in the course of publication, and promises to be one of the most curious and interesting works in existence, and to be highly illustrative of Gothic Architecture, which requires minute collateral investigation, from the buildings of the Arabs, Persians, Indians, and Turks, till which occurs, we shall still remain much in the dark upon this important subject.

It appears that Mr. Owen (the only survivor of the two gentlemen by whom this work was undertaken) is so scrupulously particular in this fine publication as to have the plates, in some instances, executed several times over before they meet his approbation.

171. King's (Edward, F.R.S. and A.S.) "*Munimenta Antiqua; or Obser-* "*vations on Antient Castles. Including Remarks on the Whole Progress of Archi-* "*tecture, Ecclesiastical, as well as Military, in Great Britain: and on the Corre-* "*sponding Change in Manners, Laws, and Customs. Tending both to Illustrate* "*Modern History: and to Elucidate many Interesting Passages in various Antient* "*Classical Authors.*" 3 vols. fol. London, A.D. 1799-1804.

This work, taken in connexion with the same gentleman's treatises in vols. iv. and vi. of the "*Archæologia,*" furnishes the Practical Architect with the most valuable information relative to the structural peculiarities of ancient buildings; and those who do not, because the subject is abstruse, exclaim that it is a fruitless and idle research, will peruse, with some satisfaction, Mr. King's voluminous Historical Inquiry into the Origin of the Arch, vol. ii. p. 222-273.

172. Krafft's (J. Ch.) "*Plans, Coupes, et Élévations, de Diverses Productions* "*de l'Art de la Charpente, exécutées tant en France que dans les Pays Etrangers.*" —Paris, A.D. 1805. This estimable work, with which no architect should be unprovided, contains a prodigious number of plates, and is highly valuable for the practical information which it conveys.

173. Krafft's (J. Ch.) "*Plans, Coupes, Élévations des plus belles Maisons* "*et des Hotels construits à Paris et dans les environs*"—120 Plates. This is a very interesting work, and though the taste of the architectural decorations which it displays, is very frequently of a character low in the scale of art, yet many of the plans exhibit a more than ordinary degree of skill, of uniformity, of geometrical arrangement, and of successful wrestling against untoward circumstances and irregularity of site; many of these edifices, from ingenuity and regularity, are completely enchanting. The plans of modern English buildings, are in general extremely inferior: the taste for the geometrical beauties of architecture is here lost: this is a very grievous misfortune for us; for an union of convenience, beauty, taste, and constructive excellence, cannot be present in architecture, without a due use of geometrical skill. In general, except in very small buildings, regularity and elegance cost nothing whatever, nor needs a true master of design, to sacrifice the slightest portion of convenience, while he is creating beauty: none but a bungler in architecture, produces convenience without beauty, or beauty without convenience, unless he be thwarted.

CHAPTER XXIII.

174. LABELYE'S (Charles) "*Description of Westminster Bridge. To which "is added, An Account of the Methods made use of in laying the Foundations of its "Piers. And An Answer to the chief Objections that have been made thereto. With "An Appendix, containing Several Particulars, relating to the said Bridge, or to "the History of the Building thereof. As also Its Geometrical Plans, and the "Elevation of one of the Fronts, as it is finished, Correctly engraven on two large "Copper Plates.*" London, A.D. 1751. This is a most interesting work, as it is one of the very few accounts which have been left by Practical Architects and Engineers, of the conduct and process of their works. Labelye appears to have been the first to practise the mode of building the Piers of Bridges in caissons; and although some settlement in one of the piers took place immediately after the arches were turned, his boldness in the operation may be accounted both economical and successful, and there may exist occasions proper for following the same method: but whether the practitioner feel confidence or not in Labelye's process, he cannot fail of receiving pleasure from the perusal of his work as an *Historical Record of Practical Art*. In the year 1750, Labelye re-constructed the two arches which were injured by the sinking of the Pier; and he evinced considerable skill, by forming, over the same pier, a counter-arch between the two great arches, resting upon the sunken pier: this last constructive peculiarity, has been followed in the bridge subsequently erected over the Thames near the Strand.* Labelye seems to have obtained the equilibrium of the arches of his bridge, with practical success, since they were turned without different centres being provided for all the arches, but only for those differing in dimension; and although two of the arches were taken down in order to repair the failure, yet no want of equilibrium in the other arches of the bridge was found, and no settlement of them occurred during that operation. As the best mathematicians agree that practical caution has hitherto done more than mathematical theory, towards procuring the stability of arches, the words of Labelye himself on this important subject are here given.

176. "In order to give the utmost Strength to the Arches of the Bridge, I "design'd their Construction very differently from the common Way of building "such Arches; for in order to destroy or counterballance the *Thrust*, or *lateral* "*Pressure*, which with all Arches (even the semicircular ones) do endeavour to "separate, or overset their Piers, every Arch of *Westminster Bridge* (except the "two small ones at the Abutments) is double, the first Arch is semicircular, built "with great Blocks of *Portland* Stone, from 3 to 5 Feet in Height, or Depth; "over which there is another Arch built with Purbeck Stones, bonded in with "the under semicircular Arch. This upper Arch, is of a particular Figure, or "Curve, four or five times thicker in the Reins, or towards the Bottom, than at "the Key or Top. Both these Arches taken together, do form a kind of Arch, "which can be demonstrated to be in *equilibrio*, in all its Parts: By means of "these secondary Arches, and the proper Disposition of the super-incumbent "Materials, every Arch of *Westminster Bridge* is able to stand by itself, in- "dependent from the Abutments, or any other Arch. I asserted above twelve "Years ago, that Arches thus constructed, must have that Property, as a "necessary Consequence, from a Mathematical Proposition, as clearly demon- "strated as any one Proposition in *Euclid* or *Apollonius*; and the Truth of my "Assertion has since been put out of all Doubt; for when by the settling of the "Western 15 Foot Pier, in 1747, it became necessary to take down the two "adjoining Arches, and to rebuild them, all the other Arches, even the next to "them on each Side, stood firm, and well (tho' unsupported on one Side),

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173. * Dr. Robi..son in his "System of Mechanical Philosophy," describes and represents the same description of counter-arches as constructed over the Piers of Blackfriars' Bridge, and the same peculiarity is shewn in a print of that bridge by Dubourg: but Sir David Brewster, in the new edition of Dr. Robi..son's work, denies the existence of these counter-arches in Mylne's construction.

" nor were they at all affected, by two severe Shocks of Earthquakes, that were " felt in *London*, in *February* and *March*, 1749, to the great Amazement of many, " and the no less Confusion and Disappointment of not a few malicious or ignorant " People, who had confidently asserted and propagated the Notion, that upon " unkeying any one of the Arches, the whole Bridge would fall."

177. " Between every two Arches, I have managed proper Drains to carry " off the Rain and other Waters, which might, in Time, accumulate in those Places, " to the great Detriment of the Arches; some Bridges have been ruin'd for want " of this Precaution, which should be observed in all considerable Stone or Brick " Bridges, and yet is to be found in very few."

178. " As to the Fronts of the Spandrells of the Arches, they are filled with " good and regular Purbeck Stones, with proper Bond ; and the Joints of the " Work preserve a Tendency to the Centre, as is expressed in the annexed De- " sign. This Manner of filling the Spandrels of the Arches is much preferable to " the common Way, which is, to fill what is above the Arch Stones in the Fronts, " with horizontal Courses of Stone or Brick, and to fill all the Inside with Rubble, " laid at random."

179. " It is surprising that this Manner of Arching has not been put in " Practice so often as it might. However, I shall mention a few Examples, where " the same good Precaution has been observed : The great Arch at *Venice*, called " the *Rialto*, near 100 Feet span ; the great Arch at *Vicenza*, of above 100 Feet " span ; a Groin Arch at *Blenheim*, built in this Manner, with Rubble Stones only, " which stands firm and well, though it has only three Feet $\frac{1}{2}$ rise, upon 44 Feet " span ; and all the Arches of the *Pont-Royal*, at *Paris*, so very much cried up by " the *French*, and so justly to be praised on this account, at least."

180. " Over each Point or salient Angle of each of the Piers, there is a " Semi-octagonal rusticated Turret, built with Stone, for the following Reasons : " in order, in the *first* Place, to have the Points, and the Middle of the Piers, as " equally loaded as possible, which will very much contribute to the Security of " the whole : 2ndly, to strengthen the Arches, by opposing so much more " Weight or Resistance against their *Thrust* or *lateral Pressure*; for it can be " demonstrated, that the lighter an Arch is, in Proportion to its Piers, or (what " comes to the same) the heavier the Piers are, in Proportion to the Arch, the " firmer the Arch will be: and the contrary vulgar Opinion, viz. *That the more an " Arch is loaded, the stronger it will be*, is a gross Error, as may easily be shewn." Pages 21-24.

181. LEGRAND (J. G.) and C. P. Landon's " *Description de Paris et de ses " Edifices, avec un Précis Historique et des Observations sur le Caractère de leur Archi- " tecture, et sur les Principaux Objets d'Art et de Curiosité qu'ils renferment.*" Paris, A.D. 1806-9, four parts, 8vo. This work, although upon a very small scale, from containing plans elevations and sections of the principal edifices of the French Metropolis, affords a very excellent idea of its architecture, which, indeed, does not in general yield much that is worthy of being copied in minute detail. Perhaps the architects of Paris, deserve some excuse for the comparatively small quantity of their *Prostyle* architecture, from the nature of their ordinary building-stones being so unfavourable to the formation of large detached columns, and long and massy entablatures: but certainly till within a comparatively recent period, from that difficulty, and from the reign of corrupt taste, most of their porticos and façades, seem to have had their distribution made so as to appear as irregular and ugly as possible: how much difficulty was experienced in suspending the architraves of the Louvre, and of the church of Sainte-Geneviève, may be seen on reference to Gauthy's " *Dissertation*," relative to the failure of the church, and Rondelet's

"*Traité de l'Art de Bâtir.*" But in London, where the finest Portland stone and granite can be procured of large dimensions at a moderate expense, inferiority in either the material or the construction of buildings, is disgraceful and unpardonable.

182. MAJOR's (Thomas) "*Ruins of Pæstum, otherwise Posidonia, in Magna Græcia.*" London, A.D. 1768. This publication, though it is in some measure superseded by more detailed recent works, is still valuable, and forms part of the result of that active spirit, which had awakened, and which in a very few years, led men of research to open to view those ancient architectural remains of almost every country in the world, which were before scarcely known or noticed by the natives themselves.

183. MILIZIA's (Francesco) "*Memorie degli Architetti Antichi e Moderni.*" Parma, A.D. 1781. This work, of which an elegant English translation, with some alterations and additions, has been made by Mrs. Edward Cresy, London, A.D. 1826, is well calculated to open and enlarge the mind of every architect, whether a student or an old professor. It is to be regretted, that so little *real* biography of scientific men is in existence;—nothing tends more to give a scientific student a general insight to art, than perusing the mode of action followed by his predecessors.

184. MILLER's (The Rev. George, M.A.) "*Description of the Cathedral Church of Ely.*" London, A.D. 1807. This unpretending but admirable work, fills up a part of the blank which has been left by Mr. Britton: a new edition of this work, with additional engravings, has been published, London, A.D. 1836; the illustrations of it, which are the several gifts of noblemen and other gentlemen of taste, are many of them beautifully engraved, particularly that of the Priors' Entrance.

185. MILNER's (The Rev. John, D.D. F.S.A. &c.) "*Treatise on the Ecclesiastical Architecture of England, during the Middle Ages, with ten illustrative plates.*" London, A.D. 1811.

This learned and valuable treatise, should be in the hands of every architect, antiquary, and gentleman; and although, many will no doubt in some respects differ from the accomplished author of it, relative to the origin of Pointed Architecture, still but few will be ungrateful for his illustration of a subject so difficult as the History and Study of the Ecclesiastical Architecture of the mid-eval Christians.

186. The Rev. Mr. Milner's "*Historical and Critical Account of Winchester Cathedral,*" is no less estimable than his Treatise on English Ecclesiastical Architecture.

187. MOLLER's (Dr. Georg) "*Denkmäler der Deutschen Baukunst.*" This work, with the translation of its text, "*Moller's Memorials of German-Gothic Architecture,*" by W. H. Leeds, London, A.D. 1836, is a most valuable work, as it develops principles in the formation of buildings, never before treated of: the embellishments of it, though destitute of the force and elegance of our own beautiful modern English engravings, are, from their accuracy of drawing, much to be admired: some quotations from this important work are to be found in the present undertaking, for which see the index.

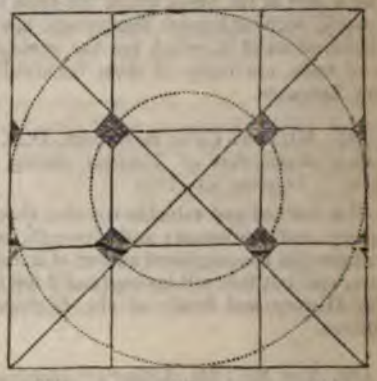
188. MURPHY's (James Cavanah) "*Arabian Antiquities of Spain.*" London, A.D. 1812-16. This sumptuous work, forms one of the most accomplished modern series of delineations ever put forth: the high price of the work (about £40.) has hitherto prevented it being very extensively known.

189. MURPHY'S (James) "*Plans "Elevations Sections and Views of "the Church of Batalha, in the "Province of Estremadura, in "Portugal, with the History and "Description by Father Luis de "Sousa; with remarks. To which "is prefixed an Introductory Dis-"course on the Principles of "Gothic Architecture.*" New Edition, London, A.D. 1836.

This beautiful work, contains delineations of the church and monastic buildings of the wonderful establishment, shewing the peculiarities of its architecture, some of which are its curious steeple of open tracery-work, its *incombustible* external roof, its lace-work carving, and its deep bold over-hanging corbeilled cornices. The preceding Essay on Gothic Architecture, although one of the earliest of this elaborate study, is one of the very best extant upon the subject: it is to be regretted, that this fine work has not more delineations of the details of so superb a building, which forms a connecting link between the Gothic Architecture of the Mahometans, and that of the Christians.

The adjoining wood-engraving, from the fifth plate of Murphy's work, shews several beautiful principles in the arrangement form and proportions of the Plan and Section of the church: nor should the reader overlook the admirable manner in which this church is roofed over entirely with stone, so that the roof neither contains combustible materials, nor causes any sectional loss of interior effect. And it should not be forgotten, that the structural excellence of this church is so great, that not only is it free from the danger of conflagration, but that it withstood with little damage, the earthquake which destroyed the city of Lisbon.

GROSS SECTION OF THE CHURCH.



Aisle. *Nave.* *Aisle.*

PLAN OF ONE COMPARTMENT OF THE CHURCH.

190. NEALE'S (John Preston) "*History and Antiquities of the Abbey Church of "St. Peter, Westminster.*" London, A.D. 1818-22. This work, which is illustrated by sixty-one engravings, and is accompanied by a history and a description of the fabric, by Mr. Edward Wedlake Brayley, will tend very much to enlighten an architect upon the subject of Pointed Architecture; though from most of its prints being perspective views, instead of plain geometrical delineations, they are of far less use for the purposes of art, than they would otherwise have been. From the want of geometrical representations, resulted in a great measure, the slowness with which a *real* revival of gothic architecture proceeded.

CHAPTER XXIII.

191. NORMAND's (Charles) "*New Parallel of the Orders of Architecture, ac-*
"*cording to the Greeks and Romans, and Modern Architects.*" London, A. D. 1829. This work, which consists of a reprint of the original French Engravings, *with Two Additional Plates, and a Translation of the Text, by Augustus Pugin*, is an elegant and an useful publication, exhibiting a compilation from several expensive works; but the practitioner will do well, rather to consult the original works from which the plates are copied, and to avail himself of all subsequent information upon the ancient examples. The plates of this work are beautifully engraved in outline; but they are not accompanied by such spirited criticisms as those of Chambray's old Parallel.

192. PALLADIO (Andrea) "*L'Architettura* (di) *divisa in quattro libri ne' quali,*
"*dopo un breve trattato de' cinque ordini, et di quelli avertimenti ch' sono piu neces-*
"*sarij nel fabricare; si tratta delle Case Private, delle Vie, dei Ponti, delle Piazze,*
"*dei Xisti, et de Tempij.*" The universal admiration of this celebrated work, the translation of it into all the languages of the civilized world, the value of its author's own architectural works, the merit of his being the first delineator of antique examples,—these are praises which a thousand ages of architectural corruption cannot obscure, and of which all the frowardness of modern critics cannot defeat him: the name of Palladio has become synonymous with architectural purity; and if some think that his fame is greater than his merit, let such ponder well what is the sure reward of excellence, even though it be not perfection. Even this great man was frequently denied the use of lasting materials, in the same manner that in modern times the most correct and talented labour under the same disadvantages, while the corrupters of their art perpetuate their shame in granite and bronze.

193. Palladio did not publish all the works which he intended; but a century and a half after his death, the Earl of Burlington discovered the original drawings of one of his works, and published engravings from them in England, under the following title,—"*Fabbriche Antiche, Disegnate da Andrea Palladio, Vicentino, e date*
"*in luce da Riccardo Conte di Burlington. Londra*, 1730." This publication consists of a volume of Plans, Sections, and some Details, of the Roman Baths, but is unaccompanied by the text, which the Earl could not meet with, notwithstanding his ardent search for it. Copies of these Plans, so replete with magnificence, convenience, and beauty, should be possessed by every one connected with the practice of architecture.

194. PASLEY's (C. W. Lieut. Colonel, F.R.S.) "*Outline of a Course of Prac-*
"*tical Architecture, compiled for the use of the Junior Officers of the Royal Engineers.*" Chatham, A. D. 1826. This work, executed at the Government Establishment entirely in Lithography, and which, from not being in general circulation, the author of this undertaking but recently met with, is worthy of appreciation.

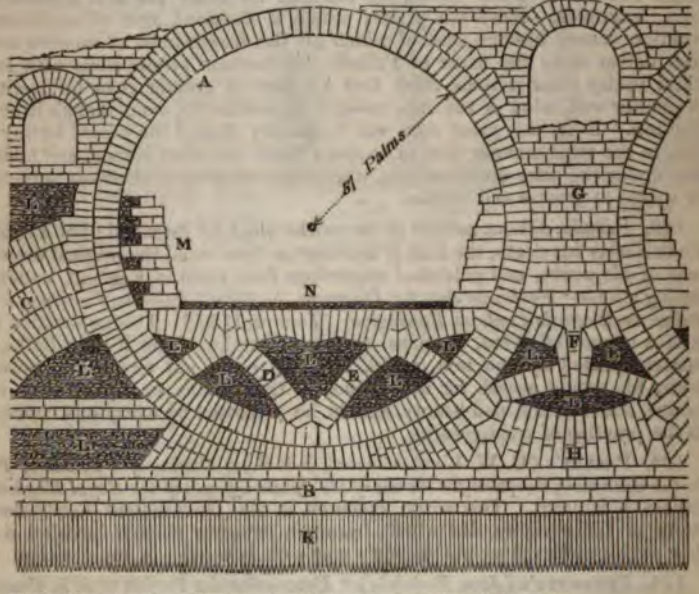
195. PERRONET's (*Jean Rodolphe*) "*Description des Projets et de la Construc-*
"*tion des Ponts de Neuilly, de Mantes, d'Orléans & autres; du Projet du Canal de*
"*Bourgogne, pour la communication des deux Mers par Dijon; et de celui de la con-*
"*duite des eaux de L'Yvette et de Bièvre à Paris. En soixante-sept Planches,*" 2 vols. folio. Paris, 1782-3. This superb publication, is worthy of the most attentive consideration: such detailed accounts and delineations of great works are particularly valuable, as well for information relative to their structure and progress, as to shew how best to avoid any defects which may have occurred in them. The work contains some specifications for works of engineering, which are valuable, from their affording an account of the processes which have been adopted by the French in their considerable undertakings.

196. PIRANESI (Giambatista). The astonishing labours, of this wonderful artist engraver and architect, will ever excite admiration: every architect should have always beside him in his study, some of the very best of Piranesi's engravings, in order to banish from his mind every inroad of meanness, either in design or drawing. Since the days of Piranesi, the noble boldness of architectural

engraving, has in a great measure disappeared, particularly with the French and Germans; though how capable the French still are of giving fine architectural delineations, may be seen by the magnificent and astonishing French National Work upon Egypt.

197. How it was possible for a man, to produce such a prodigious number of such grand engravings, must ever appear astonishing: the following titles will afford to those unacquainted with Piranesi's works, some idea of the artist's industry, and the importance of his labours; and it must not be forgotten, that more insight into the construction of the Roman buildings, may be gathered from Piranesi's delineations, than from any other published works.

198. " LE ANTICHITÁ ROMANE, *Divisa in quattro tomi, nel primo de'quali si* " *contengono gli Avanzi degli Antichi Edifizj di Roma, disposti in Tavola Topo-* " *grafica secondo l'odierna loro esistenza, ed illustrati co' frammenti dell' antica* " *icnografia marmorea, e con un indice critico della loro denominazione: arrichito* " *di Tavole Suppletorie, fralle quali, si dimostrano L'elevazione degli stessi avanzi:*

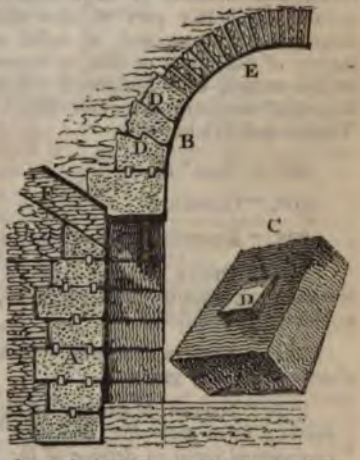


A. Circles of stone wedges, forming one of the two Great Arches of the Bridge.
B. Sub-basement, consisting of four courses of Masonry, forming a complete platform beneath the whole of the work of the Bridge. *See George Semple, § 235, on the same subject.*
C. Circular Counter-buttress at each extremity of the Bridge, consisting of five layers of stone wedges, rising from the stone sub-basement to the backs of the haunches of the great arches, in order to prevent the great circles from expanding.
D. Another circular Buttress (beneath the bed of the river), opposed to the lower course of the Counter-buttress C. at each extremity of the Bridge.
E. Other circular Buttresses, which meeting together at the great central key-stone F. sustain the great Pier G.
H. Great Counter-arch between the great arches.
K. Piles of wood, beneath the whole of the work.
L. Masonry in courses of " *Opus Incertum.*"
M. Additions made by the Consuls, by way of reparation.
N. Pavement at the bed of the river.

Piranesi represents two plugs in every joint of the Masonry; but while this structural peculiarity cannot be disproved, it would, perhaps, be difficult to prove the existence of it, without destroying the Bridge to ascertain the fact. The vousoirs and pier-stones of Black-friars' Bridge, at London, are prevented from slipping, by the insertion of cubes of hard stone in their joints. See § 224. And much the same means were adopted by Smeaton, in order to prevent the power of the sea waves from sliding upon each other the horizontal courses of the masonry of the Edystone Light-house.

" *l'andamento degli antichi Aquedotti nelle vicinanze e nel dentro di Roma, corre-*
" *lativo al Commentario Frontiniano ivi esposto in compendio: la Pianta delle Terme*
" *le più cospicue: del Foro Romano colle Contrade circonvicine: del Monte Capi-*
" *tolino: ed altre le più riguardevoli. Nel Secondo, e nel Terzo, Gli Avanzi de'*
" *Monumenti Sepolcrali esistenti in Roma, e nell' Agro Romano, colle loro rispet-*
" *tive piante, elevazioni, sezioni, vedute esterne ed interne: colla dimostrazione de' sar-*
" *cofagi, ceppi, vasi cenerarj e unguentarj, bassirilievi, stucchi, musaici, iscrizioni, e tutt'*
" *altro ch' è stato in essi ritrovato: e colle loro indicazioni e spiegazioni. Nel quarto I*
" *Ponti antichi di Roma che inoggi sono in essere, colle Vestigia dell' antica Isola Ti-*
" *berina, gli Avanzi de' Teatri, de' Portici, e di altri Monumenti, eziandio colle loro*
" *indicazioni e spiegazioni.*" Roma, A.D. 1756. It is not intended to go here into any eulogium of this splendid, well-known, and highly appreciated work, every single plate of which is a treasure. But the author cannot abstain from giving a copy of part of the nineteenth plate of the fourth volume of the section of the *Ponte Fabrizio*, which is a successful master-piece of Roman engineering.

199. Semple, in the construction of the Essex Bridge at Dublin, has made use of an entire sub-basement, which he calls a *Thorough Foundation*, under the whole extent of the bridge, much in the same way as that under this fine Roman structure, which has withstood the effects of time and flood for nearly two thousand years: the truth is, our bridges have the foundations of their piers, sometimes of too small extent: if the piers themselves, were made of the very hardest granite which could be procured, and were formed of as few blocks as possible, both in their vertical and in their horizontal sections, they might be reduced to an amazing smallness, without crushing or giving way; but not so the feet upon which they stand; the deeper and wider *they* are, the more excellent and lasting will in general, be the work: what effect accident and circumstances may have upon the best structures, built in the water, with but small spread and depth of foundation, may be gathered from the considerable, though compact settlement of the New London Bridge, occasioned by the rapidity of the water tearing away the bed of the river to a prodigious depth, while the river, to save the paltry expense of a temporary bridge, was at once obstructed by the old bridge, and by the coffer-dams of the new bridge. It is well that from timely discovery, the exquisitely noble and beautiful new bridge was not ruined.



A. Internal Ashlaring round the Sepulchre, formed of Blocks of Travertine Stone, secured from slipping by Pins or Plugs in the horizontal joints of the work.
B. Lower part of the Vaulting of the Sepulchre, formed of three courses of Travertine Stone Vousoirs, joggled together.
C. View of one of the Stone Vousoirs, drawn to a larger scale.
D. D. Joggles in the form of Wedges, rising from the upper side of one Vousoir into the under side of the Vousoir immediately above it, so as to prevent one arch-stone from sliding upon another.
E. Crown of the Vaulting, composed of a kind of Rubble-work, with Radiating courses of flat stones or tiles at intervals.
F. Window slanting below the Vaulting.

200. In the second volume of the same work, are to be seen in plates 36 and 37, the delineations of an ancient Roman Sepulchre, situated upon the Appian way, in which is shewn the skilful manner in which the courses of the masonry forming the lower part of the vaulting, are prevented from sliding, by means of joggles or rests rising from the course below, and inserted in the course next above. The upper part of the vaulting, is indeed, only formed of rubble-work, with radial courses of thin flat

stones or tiles at intervals. Much the same kind of construction, is also exhibited in the twentieth plate of the third volume of the same work, where the segmental arch of a doorway of another Sepulchre, on the Appian way, is prevented from slipping, by an abutment or skew-back A, the counter inclined abutment B, the wedge-shaped process or joggle C, and the two plugs D. D. The next vousoir on each side of the arch is also steadied by a similar joggle.

201. " ANTICHITÁ *d'Albano e di Castel Gandolfo.*" Rome, A.D. 1764.

202. " DELLE *Antichitá di Cora.*" In the third plate of this work, there is the representation of a Corinthian capital, deposited in the garden of the Signior Domenico Luzj, which is similar to those of the Temple of Vesta, at Tivoli.

203. " IL CAMPO MARZIO *dell' Antica Roma.*" Roma, A.D. 1762. This is a very magnificent work, and is very worthy of most minute observation.

204. " LAPIDES *Capitolini sive Fasti Consulares Triumphalesque Romanorum* " *ab urbe condita usque ad Tiberium Cæsarem,*" A.D. 1762.

205. " LE ROVINE *del Castello dell' Acqua Giulia, situato in Roma presso* " *S. Eusebio e falsamente detto dell' Acqua Marcia, colla Dichiarazione di uno de'* " *celebri passi del Comentario Frontiniano, e Sposizione della maniera con cui gli* " *antichi Romani distribuivano le acque per uso della citta.*"

206. In the first plate of this work, is shewn a remarkable instance of large arches, which have existed the better part of two thousand years, although not composed of solid vousoirs,—but merely of flat stones or tiles, at intervals, radiating to the centre, with horizontal courses of " *Opus Incertum*" masonry between them, consisting of Tophus and Bricks.

207. " VASI," &c.

208. " CARCERI."

209. " DESCRIZIONE *e Disegno dell' Emissario del Lago Albano.*"

210. " DELLA *Magnificenza ed Architettura de' Romani,*" A.D. 1761. This work is most magnificently engraved, and is calculated to excite the student to nobleness of practice.

211. " VEDUTE *di Roma.*" This is a most superb work. The " *Veduta del Pantheon*" is very grand.

212. " DIVERS MANNERS *of Ornamenting Chimneys and all other parts of* " *houses; taken from the Egyptian, Tuscan, and Grecian Architecture: with an* " *apologetical essay in defence of the Egyptian and Tuscan Architecture.*" Rome, 1769. The text of this work, which is extremely well written, is given in three languages, viz. Italian, English, and French. This superb work, exhibits great invention, talent, and ability; but no one could expect other from so noble an artist.

213. PORTER'S (Sir Robert Ker) " *Travels in Georgia, Persia, Armenia,* " *Ancient Babylonia, &c. &c., during the years* 1817, 1818, 1819, and 1820." London, A.D. 1821.

This work is valuable from exhibiting the remains of the ancient architecture and sculpture of Persepolis; nor will the student regret examining a woodcut at page 757 of the second volume, in which is a sketch of some curious ornamental Turkish chimney-shafts.

214. Pugin's (Augustus) "*Specimens of Gothic Architecture: selected from various ancient Edifices in England: consisting of Plans, Elevations, Sections, and Parts at Large; calculated to exemplify the Various Styles and the Practical Construction of this admired class of Architecture;*" accompanied by "*Remarks on Gothic Architecture, by E. J. Willson,*" with 114 Engravings. This valuable work is generally esteemed: the painfully critical antiquary, will perhaps here and there detect some cause for criticism upon the accuracy of the plates; but the work is exquisitely beautiful; and if any parts of it have been surpassed in accuracy, none have gone further in that respect, than the same artist has in his later productions; but it is a draw-back upon the usefulness of the work, that it is not arranged chronologically: whatever be the expense, a chronological arrangement of it ought to be made at the next edition.

215. Very valuable, also, are Mr. Pugin's "*Examples of Gothic Architecture,*" in 2 vols. This work is also enriched by literary matter from the pen of Mr. Willson: and Pugin's (Augustus) "*Plans, Elevations, Sections, and Parts at Large, of the Vicar's Close, at Wells, Somersetshire: accompanied by an Historical and Descriptive Account by Thomas Larkins Walker.*" London, A.D. 1836. This posthumous work is very valuable, from affording fine specimens of Church Domestic Architecture; in particular it contains delineations of one of the most exquisitely beautiful Oriel Windows in existence. "*The History and Antiquities of the Manor House and Church of Great Chalfield, Wilts,*" A.D. 1837. "*The History and Antiquities of the Manor House of South Wraxhall, and the Church of Saint Peter at Biddestone, Wilts,*" A.D. 1838. These Three Works, are now published together as a 3rd Volume of Pugin's "*Examples of Gothic Architecture.*"

216. Pugin (Augustus) and John and Henry Le Keux's "*Engraved Specimens of the Architectural Antiquities of Normandy;*" with an "*Historical and Descriptive Essay,*" *by John Britton.* London, A.D. 1825-33. This invaluable work, containing eighty Engravings, and which is to be purchased at a price infinitely beneath its value, will one day become highly esteemed, and will be purchased at any price: for the extreme accuracy of its plates, this work perhaps in execution goes beyond all other architectural works: it chronologically ranges over the Norman architecture, from the early Romanesque style, to that which has been called the Burgundian: as a practical work, the vaultings and numerous details delineated in it, are of infinite service: many of the profiles and ornaments are of the most elegant description; though the introduction to England of some of them, which are of the later style, which has been called the Burgundian, would injure our architecture, and cause regret in the mind of every lover of pure art.

217. (de) Quincy's (Quatremère) "*Histoire de la Vie et des Ouvrages des Plus Célèbres Architectes du XI^e^ Siècle jusqu'à la fin du XVIII^e^ accompagnée de la Vue du Plus Remarquable édifice de chacun d'eux.*" Paris, 1830. This beautiful and entertaining work, cannot be read without advantage by any one connected with architecture: the value of the publication is considerably enhanced, by so small a manual containing views of some of the most beautiful edifices of Modern Europe: and those who are not otherwise conversant with the fact, will learn to feel deeply the injury which has always resulted to architecture, both Practical and Decorative, from the interference of other architects in the same work, of which the instance of the Church of the Vatican, is most memorable, having lost structural excellence and uniformity of style, besides many of the higher qualities of art, from the putting up and pulling down, the alterations and additions, of many succeeding architects, who either did not understand, or who could not feel, the motives of their predecessors,—so that the unbounded riches employed in that celebrated fabric, have only produced a small portion of the beauty and grandeur which would have resulted from the execu-

tion of one great original architectural conception, planned all at once, and finished without giving in to any specious pretence for improving any part of the work ;—a weakness, the child of restless and little minds, which has ruined nearly all the great architectural works throughout the world. A work finished according to its original design, may be imperfect in the opinion of some ; but a work built partly in one style, and partly in another style, is imperfect by the universal consent of all mankind.

218. RICHARDSON (Geo.) *See* Colen Campbell, § 106.

219. RICKMAN'S (Thomas) "*Attempt to Discriminate the Styles of Architecture* "*in England, from the Conquest to the Reformation*," fourth edition. London, A.D. 1835. This valuable elementary work, has done much towards a due chronological classification of Gothic Architecture, and should be possessed by every English Architect and gentleman ; but it is to be regretted, that a work which from its merit has already gone through three editions, should be illustrated by figures so small and so meanly engraved : a standard work like this, should have its delineations executed in the boldest and most elegant manner upon steel plates. The author, however, must object to the propriety of the term, "*Cusp*," being applied to the "*Foliations*," or small arched subdivisions of large arches, instead of to the *Points of Union between the different Foliations*. In the present immature state of our knowledge of Gothic Architecture, the gradual formation of a correct nomenclature is of great importance, and the introduction of improper terms is of incalculable injury. The very term, *gothic*, as applied to Pointed Architecture, though believed to be improper, has become unalterably fixed, by the uncertain *apparent* meaning of the many new terms which have been invented instead of it, and which, from their multitude, have only confused the subject.

220. ROBISON'S (John, LL.D. late Professor of Natural Philosophy in the University of Edinburgh) "*System of Mechanical Philosophy*," "*with Notes by* "*David Brewster, LL.D. Fellow of the Royal Society of London, and Secretary to* "*the Royal Society of Edinburgh*," in 4 vols. 8vo. with a volume of plates. Edinburgh, A.D. 1822. This work, of such high value, contains in the first volume of it the following sections, to the architect of most peculiar interest : "*Strength of Materials*," "*Carpentry*," "*Roof*," "*On the construction of Arches*," "*On the construction of Centres for Bridges ;*" and in the second volume of it, a section on *Pumps*. Various quotations from Dr. Robison's work will be found in this undertaking, for which see the Index. With regard to the "*Equilibrium of Arches*," the Doctor makes the following acute remarks :—

221. "This much will serve, we hope, to give the reader a clear notion of "this celebrated theory of the equilibrium of arches, one of the most delicate and "important applications of mathematical science. Volumes have been written on "the subject, and it still occupies the attention of mathematicians. But we beg "leave to say, with great deference to the eminent persons who have prosecuted "this theory, that their speculations have been of little service, and are little "attended to by the practitioner. Nay, we may add, that Sir Christopher Wren, "perhaps the most accomplished architect that Europe has seen, seems to have "thought it of little value : for, among the fragments which have been preserved "of his studies, there are to be seen some imperfect dissertations on this very "subject, in which he takes no notice of this theory, and considers the balance "of arches in quite another way. These are collected by the author of the "Account of Sir Christopher Wren's family. This man's great sagacity, and his "great experience in building, and still more his experience in the repairs of old "and crazy fabrics, had shown him many things very inconsistent with this "theory, which appears so specious and safe. The general facts which occur in "the failure of old arches are highly instructive, and deserve the most careful "attention of the engineer ; for it is in this state that their defects, and the pro-

" cess of nature in their destruction, are most distinctly seen. We venture to " affirm, that a very great majority of these facts are irreconcileable to the theory. " The way in which circular arches commonly fail, is by the sinking of the crown " and the rising of the flanks. It will be found by calculation, that in most of the " cases it ought to have been just the contrary. But the clearest proof is, that " arches very rarely fail where their load differs most remarkably from that which " this theory allows. Semicircular arches have stood the power of ages, as may " be seen in the bridges of ancient Rome, and in the numerous arcades which " the ancient inhabitants have erected. Now all arches which spring perpendicu- " larly from the horizontal line, require by this theory, a load of infinite height ; " and, even to a considerable distance from the springing of the arch, the load " necessary for the theoretical equilibrium is many times greater than what is " ever laid on those parts ; yet a failure in the immediate neighbourhood of the " spring of an arch is a most rare phenomenon, if it ever was observed. Here is " a most remarkable deviation from the theory ; for, as is already observed, the " load is frequently not the fourth part of what the theory requires.

222. " Many other facts might be adduced which shew great deviations from " the legitimate results of the theory. We hope to be excused, therefore, by the " mathematicians for doubting of the justness of this theory. We do not think " it erroneous, but defective, leaving out circumstances which we apprehend to be " of great importance ; and we imagine that the defects have arisen from the " very anxiety of the mathematicians to make it perfect. The arch stones are sup- " posed to be perfectly smooth or polished, and not to be connected by any " cement, and therefore to sustain each other merely by the equilibrium of their " vertical pressure. The theory insures this equilibrium, and this only, leaving " unnoticed any other causes of mutual action." § 599. p. 634 ; vol. I.

223. In the 602d section of his work (p. 643, vol. I.) Dr. Robison gives a very interesting account of the construction of Blackfriars' Bridge, London, designed and erected by Mr. Robert Mylne, which for structural excellence has never been surpassed, and has rarely been equalled in skill by any work whatever. It is only to be regretted that from the use of Portland stone, which is durable and excellent in all situations except water-works, this elegant, beautiful, and economical bridge, should in seventy years after its erection, need such consider- able repairs, not from structural failure (for few great works have been erected so successfully, and have remained so entire), but merely from the external decomposition of the material of it.

224. The Doctor's description of this bridge, is accompanied by a section shewing the construction of its arches and piers ; and the following account of the admirable manner in which the voussoirs of the arches of this master-piece of art are prevented from slipping from each other, will be read with great pleasure by all those who are not previously acquainted with the peculiarities of the work.

" All the arch stones have their joints directed to " the centres of their curvature. The joints are all jog- " gled, having a cubic foot of hard stone let half way " into each. By this contrivance the joints cannot " slide, nor can any weight laid on the crown, ever " break the arch in that part, if the piers do not yield." " The whole resists like one stone, and can be broken " only by crushing it *."

225. * It is to be deeply lamented, that from Blackfriars' Bridge having been constructed at a time when a flat roadway over a bridge was not deemed of advantage sufficient to lead to raising the abut- ments much above a low shore, with the attendant expense and disadvantage of that, the unrivalled

The reader is referred to the *Transactions of the Civil Engineers*, for an account of the ingenious manner in which the perished arch-stones of this bridge are now being restored.

226. Robinson (P. F.)—*See* Colen Campbell, § 106.

227. Rondelet's (J.) "*Mémoire Historique sur le Dôme du Panthéon Français* " *divisé en quatre Parties: La I^re. contient la description de ce Monument. La* " *II^e. le détail historique et raisonné de sa construction. Dans la III^e. Partie on* " *examine si les murs et points d'appuis du Dôme, ont les dimensions nécessaires pour* " *résister aux efforts qu'ils ont à soutenir. La IV^e. Partie contient le détail exact* " *de tous les accidens qui se sont manifestés aux piliers du Dôme, les causes de ces* " *accidens, et les divers moyens proposés pour les réparer.*"—*Paris*, A.D. 1797. This work, the author of which assisted at the erection of the church, is particularly interesting on account of its giving a description of a great work, which suffered so considerable a failure in its erection: the reader will judge for himself of the causes of it; and the plates, which show a great deal of the construction of it, will assist him in his judgment; and from them he will be the better able to determine, what parts of the construction it would be advisable for him to imitate, and what parts to avoid. The sixth plate of the work exhibits a most curious and somewhat complex arrangement of ties and suspenders of iron, inserted in the entablature and pediment of the church: this was partly necessary, from the great size of the building, and partly from the defect under which architecture labours at Paris, from most of the better sort of building-stone of that city being in very small pieces: but this mode of hanging up stones by irons, should by no means be generally followed, since in the corrosion of the iron, it carries with it the seeds of premature destruction. The same plate is also worthy of further remark, from exhibiting the arches in the entablature and Tympanum of the pediment of the great Portico.—(See also Gauthey § 148.)

228. Rondelet's (Jean) "*Traité Théorique et Pratique de l'Art de Bâtir.*" Sixth edition, 5 vol. quarto, with a folio volume of 207 excellent Plates. Paris 1830-32. This is a most beautiful and useful work, having scarcely any parallel in the English language: it includes a very wide range of Practical Architecture in every department, not only as now followed at Paris, but it also contains a very large collection of the most excellent and curious technical processes of the architecture of the ancients and of the moderns. The fifth volume of the work contains some particulars relative to Specifications (*Devis*) which, however, do not appear with the French to be made to comprehend minute descriptions for all the works necessary in a contract for a building to be executed in gross. Among an infinitude of representations and

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bridge seems doomed at no distant period to be either destroyed, or to be totally ruined in appearance: within the author's short memory, the transcendantly elegant approaches of this bridge, have been most wretchedly mutilated in order to lessen the acclivity, but this improvement is so trifling and ideal, that besides the loss of beauty, it may be doubted whether any one has yet felt any relief in the transit of the Bridge: a large mound of earth has been accumulated at each end of the Bridge, in the once-beautiful squares, which have also from additions and stuccoings shared in the general wreck. In the memory of the author, Blackfriars' Bridge, with its approaches, and the fine streets leading to it, had no parallel in the world: this it does not appear will be long the case; *the desire to be doing* seems rapidly fermenting the destruction of Mylne's delightful work: first its balustrades are giving place under the *plain parapet mania;* next its columns will be removed in order to widen the roadway, in passing over which many thousand times the author never once saw obstructed; and in the end, the City of London will have a costly but ugly production, which even its maker would be unable to recognize; or the whole Bridge will be, perhaps, rebuilt in a manner vastly inferior to the present structure in taste and engineering excellence. The citizens of London should be proud of every one of their fine public works, duly considering how scarce in architecture are both taste and structural excellence combined, and how few modern works, alleged to possess these properties, maintain their rank for even ten or twenty years. The citizens should remember, that they owe to their posterity unpolluted, the architectural beauties which they have received from their fathers. The citizens know well what enormous sums they have in modern times spent, but how few pieces of architecture they have produced. This should lead them to value those works which they have inherited freely.

descriptions of various structural peculiarities, many of which are to be found in different other works, the reader will observe in the 69th plate of Rondelet's work, at figure 11, the accompanying ancient Roman method of supporting the projection from the wall, of an architrave executed principally in rough brickwork and intended to be covered over with stucco. The example is taken from the ancient Temple of Honour and Virtue, now the Church of Sant' Urbano alla Caffarella: the description of it is to be found in the 352nd page of Rondelet's second volume, and is as follows:—

A. A. Stone Skew-backs, above the Pilasters.
B. Projecting Stone Skew-back Corbeille, in the centre of the Inter-pilastration.
C. C. Pilasters.
D. D. D. D. Short flat arches, composed of Bricks, hanging upon the Stone Skew-backs, and receiving with them, the stucco decorations of the Entablature of the Architectural Order.

Note.—In copying this mode of construction, it will be well to avoid setting a Skew-back Corbeille over any window or door, but in such case to use two of them set firmly upon the piers at the sides of the aperture.

" L'intérieur de ce monument, construit tout en briques, était autrefois revêtu " d'enduits ou de stucs qui existent encore sur la voûte, mais dont les murs sont " entièrement dépouillés. Cet état de nudité permet d'observer la construction " singulière des architraves, figurés au-dessus des pilastres corinthiens de l'attique. " Bien que ce détail soit très-peu important par lui-même, on y trouve cependant " une nouvelle occasion de signaler ce discernement exquis avec lequel les anciens " Romains savaient apprécier la portée des moyens dont il pouvaient disposer. " Une plate-bande en briques, de cette portée, aurait difficilement conservé sa " rectitude, à cause de la compression dont le mortier est susceptible ; mais au " moyen d'un sommier en pierre, fortement scellé dans le mur, ils établissent un " nouveau point d'appui au milieu de l'espace, et formant ainsi deux plat-bandes, " au lieu d'une, ils réduisent à des justes dimensions l'étendue qu'il convient de " donner à ces sortes d'ouvrages."

" Il existe à Rome plusieurs autres examples d'appareil du même genre, et " notamment au portique de Philippe, dont on voit les ruines auprès de l'église " de *Santa Maria in Cacaberis*."

229. Rondelet's *(Antoine)* " *Essai Historique sur le Pont de Rialto*." Paris, A.D. 1836. With 12 Engravings. This publication, containing delineations and a description of the celebrated Venetian Bridge, and of Palladio's design, which is believed to have been made for the same work, is a valuable addition to the stock of architectural information. The reader, will not fail to observe, considerable similarity between the arch and the inclined abutments of the bridge of the Rialto, and those of the new bridge at Chester,—which last is, however, of span immensely greater than the Venetian work. (See Transactions of the Institution of Civil Engineers of London. § 165.)

230. The inclined abutments of the bridge of the Rialto, were formed by driving an immense number of piles perpendicularly into the soil ; these were cut off severally of such a length as that the piles of each abutment should form three steps or gradations ; the heads of the piles were covered over with larch planks, and then again upon the planking was laid masonry and brickwork sufficient to change the form of the gradations into an immense *Skew-back* radiating to the centre of the arch. The *Skew-backs*, or inclined abutments of the great bridge at Chester, were formed by cutting them out of the solid rock, except where from a fault, at one part, piles of wood were used. But though the weight of a Bridge, will not drive in any further those piles which have been perpendicularly *driven home* (*enfoncés à refus*) still the drift of an enormous arch might force them *laterally* against a yielding soil, rendered perhaps soft by the flow of water, and thus cause

serious settlement and fracture in the bridge. It is therefore an undeniable structural improvement, in bridges with enormous flat segmental arches, the *skew-backs* of which are laid (as they ought to be) upon the very foundation of the work, to drive the piles home in a direction at a right-angle to the face of the *Skew-back*, as shown by the adjoining wood cut, in order that any drift and settlement of the arch may not change the positions of the piles, by forcing them laterally against a yielding soil. This mode of driving piles may be attended with some difficulty; but there are few operations of which Engineering is not in the end capable; perhaps this operation might be performed by punching the piles with a ram moved within a case set to the proper inclination, or by some modification of such a process. The piles of some works, have been set in the direction suggested, especially where they were so small as to be easily driven without heavy machinery.

231. Rosellini's (Ippolito, Direttore della Spedizione, Professore di Lettere, Storia e Antichità Orientali nell' I. e R. Universitá di Pisa, Membro Ordinario dell' Instituto d'Archeologia, e Corrispondente di Varie Accademie d'Europa,) "*Monumenti dell' Egitto e della Nubia, Desegnati dalla Spedizione Scientifico-*" *letteraria Toscana in Egitto; Distribuiti in Ordine di Materie, Interpretati ed*" *Illustrati dal Dottore Ippolito Rosellini.*" Pisa, A.D. 1834.—*Opera Pubblicata*" *sotto gli Auspicij di S. A. I. e R. Il Gran-Duca di Toscana*, etc. etc. etc."

This magnificent work is more minute than even the great French National Work upon Egypt, though in artistship and engraving it is inferior to the latter publication.

232. Rue's (J. B. De La) "*Traité de la Coupe des Pierres, où par une Mé-*" *thode facile & abregée, l'on peut aisément se perfectionner en cette Science. Ex-*" *aminé & approuvé par l'Académie Royale d'Architecture.*"—Paris, A.D. 1728, folio, with 75 plates. This most elaborate and excellent work (which is much superior to that of *Desargues*, some of the errors of which were treated of by *Curabell*,) ought to be translated into English for general circulation, if indeed, the art and the use of masonry had not in England become a mere shadow: still however, it is to be hoped, that such an edition, with notes and illustrations, and with *An Improved Theory of the Equilibrium of Arches, Vaults, and Cupolas*, the result of a careful mathematical examination of all the present theories, and of an *Enlarged Experimental Trial of every Theory and Alleged Principle and Alleged Improvement*, would do something towards raising again the architect and the mason of England, above the plasterer and the cement-maker, before whom they have at present almost voluntarily sunk.

233. Such a work should be accompanied by careful gleanings from the writings, theories, and opinions, of Emerson, Robison, Hutton, Ware, Gwilt,—and in general of all the other writers, both English and foreign, who have treated in any manner scientifically upon these subjects: and the work should be accompanied by a complete development of the Arches and Vaultings of Pointed Architecture, in which the writings of Ware and Willis would be found of great value:—and the whole work should be further accompanied by a complete History of Arches, Vaults, and Cupolas, deduced from the existing Aqueducts, Bridges, Churches, and other buildings, both ancient and modern, illustrated by correct delineations of the works alluded to, exhibiting their anatomy,—and with descriptive and critical notices of their construction and materials, the methods pursued in the building of them, their actual state, their fractures, failures, and settlements, and also accounts of the repairs which may have at any time been done to them.

234. Scamozzi's (Vincenzo) "*Idea della Architettura Universale.*" Venice, A.D. 1615. This work contains many valuable precepts in Practical Building; and it is unnecessary to say of it, that it has always been esteemed one of the best treatises extant upon the Italian revival of Classical Architecture.

235. Semple's (George) "*Treatise on Building in Water. In two parts. "Part I. Particularly relative to the Repair and Re-building of Essex-Bridge, Dub-"lin, and Bridge-Building in general, with Plans properly suited to the Re-building "of Ormond-Bridge. Part II. Concerning an Attempt to contrive and introduce "quick and cheap Methods for erecting substantial Stone-buildings and other Works, "in fresh and salt Water, quaking Bogs or Morasses, for various Purposes: fully "laid down and clearly demonstrated, by Twelve Practical Propositions, but not in "any Case exceeding ten Fathoms deep: Together with a Plan for a spacious and a "commodious Harbour for the Downs in England, projecting to 20 feet deep at low "Water. Principally addressed and peculiarly adapted to young and inexperienced "Readers.*" Illustrated by sixty-three copper plates, Dublin, A.D. 1776. This very interesting and useful work, is the labour of a self-taught Engineer. Semple appears to have been the first who used, within the British dominions, the *Coffer-dam;* the energy of an active and inquiring mind led him to this; he knew well the use and value of a description of Cement-work or of "Opus Incertum" composed of broken stone, and something like what is vulgarly termed "*concrete,*" but he never dreamed of making columns or window-heads of it:—that was left to widen the gulph between ancient architectural wisdom and modern un-architectural folly. The cautious Semple voyaged many times to see great works and their constructors, and to procure the best books upon scientific building, before he began his operations; but now, if any foolish or unprincipled quack propose or vend any thing the most absurd and disatrous, he needs not despair of receiving countenance, and that too even from these who ought to know better, and who, if they have no regard for the profitable outlay of their employers' money, might at least be expected to possess self-feeling enough to protect their own reputation. Round in the horizontal courses of the masonry, of the piers of his bridges, Semple laid Chain-bars of metal, to prevent any disturbance of the stones: and it is worthy of remark, that he made use of a continuous base of masonry under the whole extent of a Bridge, something in the same manner as that under the ancient "*Ponte Fabrizio*" at Rome: see § 198: this Semple calls a "*Thorough Foundation.*"

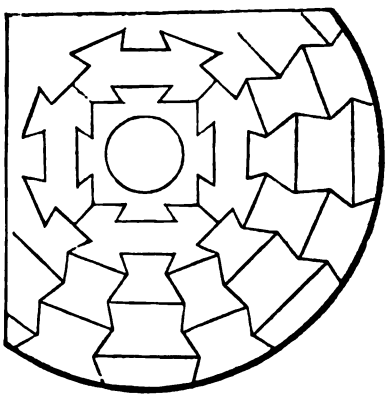
236. Serlio's (Sebastian) "*Opere d'Architettura Dove si trattano in disegno, "quelle cose, che sono più necessarie all'Architetto; et hora di Nuovo aggiunto "(oltre il libro delle porte) gran numero di case private nella Città, & in Villa.*" Venice, A.D. 1584.

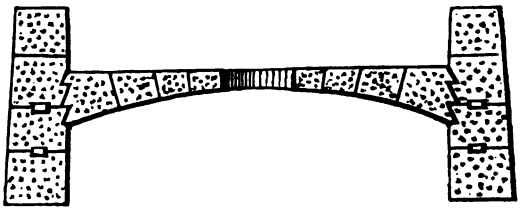
This valuable and well-known work, affords many good precepts upon Practical Building; and in the 7th Book of it are contained many Plans for Buildings, the distribution of which is ingenious, and which may be consulted with some advantage, by those who esteem this higher branch of their art.

237. Simpson's (Francis) "*Series of Ancient Baptismal Fonts, Chronologically "Arranged.*" London, A.D. 1828.—With descriptions and an essay by that accomplished amateur and antiquary William Twopenny, Esq. This is a most discriminating and valuable publication, and should be possessed by every one connected with architecture.

238. Smeaton's (John) "*Narrative of the Building, and a Description of the "construction of the Edystone Light-House with stone; to which is subjoined an "Appendix, giving some Account of the Light-House on the Spurn Point, built upon "a sand.*" This invaluable work should be in the hands of every architect, engi-

neer, and practical builder: it shows how scientific acquirements, united with extreme caution and natural ability, can overcome the greatest difficulties. Smeaton had no instructor in architecture or engineering, yet in the latter branch of building, he proved himself a first-rate master: this work contains a complete journal of the operations, and besides most excellent observations upon the choice of stone, it contains a matchless account of experiments upon building-cements. Worthy of admiration is the peculiar manner in which are dove-tailed together the stones of the Edystone Light-House, over which the storm-billows dash in their maddest fury: nor is the manner in which the domed floors of the structure are laid into the encompassing masonry of the walls, the least meritorious part of this celebrated work.





Jean Rondelet is of opinion, that the perusal of Belidor's works, suggested to Smeaton, the idea of dove-tailing the Lighthouse into the Edystone rock, as practised in the bed or paving of the great sluice of Cherbourg. See Rondelet's "*Art de* "*Batir,*" vol. 2, page 20, 6th edition; and an indication of the same principle may also be seen in the 43rd plate of the "*Treatise on Building in Water,*" by George Semple, who studied the works of Belidor, as far as he was able, without understanding their language, which Semple acknowledges he could not read.

239. STUART (James) and Nicholas REVETT's "*Antiquities of Athens,*" with a supplement of "*Antiquities of Athens and other places in Greece, Sicily, &c.*" by C. R. Cockerell, W. Kinnard, T. L. Donaldson, W. Jenkins, and W. Railton. It would be impertinent to pass any eulogium upon this immortal work: good architects of other nations will ever be jealous of the honour which Britain has acquired by this noble publication; what elevation of mind, what refinement of art, what delicacy of taste, result from a *due* appreciation of the architecture of the Greeks, may be seen at the Chapel of Greenwich Hospital, the interior of which Stuart rebuilt, and which is a model of beauty and elegance, although it is evident that Stuart in some manner endeavoured to conform the taste of it to the Italian exterior of the edifice, and has exaggerated the quantity of ornament so as to be on a level with, or to outvie, the princely nature of the surrounding buildings:—and although it is farther apparent, that from a want of acquaintance with Grecian details, the workmen were unable to catch correctly the ideas which the mind of the architect wished to be conveyed: but if this patriotic, accomplished, and genuine architect, could have foreseen the wreck which has fallen upon his country's architecture, from the libellous plasterings of the ignorant and base-minded, perhaps he would have followed the example of the Venetians, who in the year 1687 besieged Athens and ruined the Parthenon, and would have destroyed, if possible, every remaining vestige of Athenian

architecture. How would this immortal artist have groaned in spirit, at beholding the Grecian pediment sinking like a pack-horse, beneath a huge surmounting burthen; how would he have nauseated at viewing haggard porticos with their columns danced into the disorder of every imaginable kind of inter-columniation, sometimes all in the middle of a façade, sometimes all at the ends of it, sometimes with one column in the centre of a portico, sometimes with the columns twenty diameters apart, sometimes with the frieze stabbed through and through with ghastly wounds, sometimes with triglyphs swollen out to support a gallery, sometimes with the columns stilted as it were upon cheeses, sometimes with the Grecian Doric abacus *filleted* in the Roman style; rather than such corrupt baseness and affectation, should with unprincipled savageness, have put to flight taste, geometry, and constructive excellence, he would have destroyed his matchless work, the due use and appreciation of which is left for another age:—justly indignant was this great man at Le Roy's wretched book-libel upon Grecian art, but how would his classical wrath have risen at the thousand practical false witnesses which have sprung up in London and its vicinity, as if in one conspiracy, to banish for ever from England, by their garbled testimonies, the excellence of Grecian architectural purity:—what would Stuart have felt at beholding Grecian art, at length seeking refuge in the lowest public-houses, where it flourishes brazened and corrupted, while it flees from the church, the palace, and the public hall?

240. Taylor (G. L.) and Edward Cresy's "*Architectural Antiquities of Rome.*" A.D. 1821-2. This very fine work needs no recommendation; most architects who can afford to purchase it, will not remain without it; besides being more extensive than the work upon the same subject by *Des Godetz*, it is generally acknowledged to be much more accurate.

241. "Topographical Society" (The Publications of the). The Works of this lately-founded Society, promise to be to the Practical Architect, of peculiar interest: it is intended by this Society, to put forth correct geometrical and pictorial representations of the most valuable existing architectural works; nor can there be a doubt, that these delineations will be esteemed according to their intrinsic value and usefulness:—if such a society could form an extensive correspondence with other similar societies in various parts of the world, much might speedily be done towards a revival of the *Genuine Free-masonry of Architecture*; and this would banish at once all ignorance in architectural detail and structure on the part of the designer and builder: the great mass of the people might then soon become disgusted with inferiority in buildings; and whereas at the present day, vulgarity and meanness form the almost universal characteristics of our buildings, these bad qualities might become as rare in modern structures as the strictest scrutiny finds them in those of our fore-fathers.

242. Tredgold's (Thomas) "*Elementary Principles of Carpentry; a Treatise on the Pressure and Equilibrium of Beams and Timber Frames; the Resistance of Timber; and the Construction of Floors, Roofs, Centres, Bridges, &c., with Practical Rules and Examples. To which is added, an Essay on the Nature and Properties of Timber, including the Method of Seasoning, and the Causes and Prevention of Decay, with Descriptions of the Kinds of Wood used in Building. Also, numerous Tables on the Scantlings of Timber for different purposes, the Specific Gravities of Materials, &c.*" This is a most valuable work: in addition to its merits as a practical and scientific work, it possesses the rare merit for a technical work, of being elegantly written, and most admirably arranged; its excellencies are many, and its faults are few: no other work upon the subject contains such excellently arranged tables, suiting the comparative scantlings of timbers to the respective cases which may occur; but the practitioner must exercise his own judgment, as to whether *the degree* of strength which Tredgold assigns, will suit *his particular purpose*. From not considering whether particular theories are suitable to particular cases,

result many of the failures in buildings; and authors are condemned, when the blame should attach to those, who from ignorance or carelessness, misapply an excellent theory; the practitioner always remembering that in a subject so costly as a building, it is always best to err on the side of strength, for fear of the heavy expence and the loss of life which frequently occur from failures in buildings; for though the architect should know how to build with the very smallest quantity of materials, yet he should never in practice dare too much on such knowledge.—The same Author's "*Practical Essay on the strength of cast iron,*" "*with an exten-*" *sive Table of the properties of materials*" is an excellent companion to his *Carpentry*, as is also his work on the "*Principles of Warming and Ventilation.*"

243. TURNBULL'S (William) "*Treatise on the Strength and Dimensions of* "*Cast Iron Beams, when exposed to Transverse Strains, from Pressure or Weight:* "*with Tables of Constants, to be used for calculating the Strength and Dimensions* "*of similar Beams of Wrought Iron, and several sorts of Wood generally employed* "*for Architectural and Mechanical Purposes. To which is added, the Theory of* "*Bramah's Hydro-mechanical Press.*" London, A.D. 1831, and,

244. "*Practical Treatise on the Strength and Stiffness of Timber, intended* "*as a Guide for Engineers, Architects, Carpenters, etc. etc. etc., in estimating the* "*Strength, Stiffness, and Magnitude of Beams, to be employed in Buildings and other* "*Works. To which is added, an Abstract of Problems and Rules, with Tables for* "*estimating by Inspection, the Strength, Magnitude, and Flexure of Cast Iron and* "*Timber Beams: also, Tables of the Properties of Timber, Metal, Brick, Clay,* "*Earth, and Stone.*" London. A.D. 1835.

These two valuable Practical Works, will very materially assist the constructive Architect, in leaving mere conjectural ignorance for the pursuit of Theories the result of Experimental truth.

245. UGGERI'S (Angelo) "*Trè Ordini della Greca Architettura.*" Rome, A.D. 1804-17. This Chronological Parallel of Ancient Architecture, though little known in England, is not without merit, and may well hold a place in the libraries of those Practical Architects who can procure it.

246. VIGNOLA'S (Jacomo Barozzio da) "*Regola delli cinque Ordini d'Archi-*" *tettura.*" This work, which is one of the most esteemed of the Italian school of architecture, may be still consulted by a student, desirous of acquaintance with the revived Italian style: there are in the work some fair examples of Doorways in that style.

247. VITRUVIUS (Marcus) POLLIO "*de Architectura.*" The work of this celebrated and worthy man, needs at this time of day no panegyric: with all its perfections and imperfections, real and alleged, it will survive many ages all who are so rash as to abuse it. Though he who writes a deprecatory treatise upon Vitruvius, writes the sharpest possible critique upon himself, it has lately become the fashion with the inexperienced to abuse this great master. He who at the age of twenty or twenty-five, writes such a condemnation, will in ten years retract his abuse; and after twenty or thirty years more, will find that Vitruvius knew more than himself, and what very few ever did, viz. nearly all the science of his time.

Of this work, there have been many translations into different languages,—Mr. Joseph Gwilt enumerates forty-two versions of it, besides his own. As all commentators agree in the extreme difficulty of understanding the technical language of this author, every modern will avail himself of the translations in different languages, as the best gloss by the most learned upon the subject.

248. WARE'S (Samuel) "*Tracts on Vaults and Bridges. Containing Obser-*" *vations on the various Forms of Vaults; on the Taking Down and Rebuilding Lon-*" *don Bridge; and on the Principles of Arches: illustrated by extensive Tables of*

"*Bridges. Also containing the Principles of Pendent Bridges, with reference to "the Properties of the Catenary, applied to the Menai Bridge. And a Theoretical "Investigation of the Catenary.*" London, A.D. 1822.

249. The fund of information contained in these tracts, is truly delightful. The following quotation from the 19th page of this volume, cannot be so much esteemed as the other parts of the work; for the Practical Architect has no right to waste the property of his employers, and to endanger the lives of mankind, in practising those expensive experiments on his buildings, which it is the duty of the wise successful and humane theorist, to perform with more certainty and at very small expense upon numerous proper models: for prudent successful generals and architects, will ever rank with the bulk of mankind, above those who possess more brilliant talents accompanied by the draw-back of rashness.

250. "The disastrous effects from the weight of the Lantern on the dome "of St. Peter's, notwithstanding the deviation from Michael Angelo's design, so "alarmed Sir Christopher Wren, that he was determined neither to trust to "science nor to chance; and the cone was chosen, *being a form which concentrated "the risk in the frangibility of the material;* of the ability of which he could obtain "proof independent of theory. Sir Christopher Wren, had seen an English Tile-"kiln, and its cylindrical supported shaft. It might have been remembered that "the merit did not consist in supporting an immense weight, but in the means. "A cone prevented from spreading at the base, will sustain any weight at the "vertex; but a given weight, supported by a dome, demands its peculiar curva-"ture; *and it is more praise-worthy to have partially failed at St. Peter's than to "have succeeded at St. Paul's.*"

251. "*Remarks on Theatres; and on the Propriety of Vaulting them with Brick "and Stone: with Observations on the construction of Domes, and the Vaults of the "Free and Accepted Masons.*" London, A.D. 1809.

This very talented tract, contains a strong appeal upon the subject of forming Theatres of incombustible materials, both for safety and for real economy.

252. WHEWELL'S (The Rev. W.) "*Architectural Notes on German Churches,*" with "*Notes written during an Architectural Tour in Picardy and Normandy.*"—Cambridge, A.D. 1835. This work is another of those gigantic strides, which in an incredibly short time, have in the commencement of the nineteenth century, been made on the road to the revival of Gothic Architecture:—this ingenious gentleman's sections relative to Gothic Vaulting, are truly admirable:—this work, will hereafter form an important part of the material for a complete revival of Pointed Architecture.

253. WHITTINGTON'S (The Rev. G. D.) "*Historical Survey of the Ecclesias-"tical Antiquities of France; with a view to Illustrate the Rise and Progress of "Gothic Architecture in Europe.*"—London, A.D. 1811. Nothing can better prove the very great value, of this posthumous work of the young but talented and very discriminating author, than the increasing estimation in which it is held, by those well qualified to judge of its merits. In a subject so new as the re-study of Pointed Architecture, the models of which left to us by our ancestors are so innumerable, but the precepts so few, it can occasion no wonder, that very many theories, should in modern times be started by the awakened inquirer. If even an imperfect Vitruvius had written upon Gothic architecture, no doubt, we should much sooner, have been let into some of the secrets which governed the great masters of the middle ages, in their admirable works; though indeed it has in the nineteenth century, become the fashion with the conceited and ungrateful, to look upon Vitruvius, who possessed almost all the science of his time, as a blind guide, and an obscurer of his art—forgetful, that nine tenths at least of the ancient works are lost,—and that without his venerable work, we should, perhaps in modern times, never have hit upon any leading method of arranging and apportioning the decorations of a building.

254. WILD's (Charles) "*Illustrations of the Architecture and Sculpture of the "Cathedral Church of Lincoln.*"—London, A.D. 1819. This exquisitely beautiful work, containing 16 most highly finished engravings (among which the longitudinal section and the exterior and interior views are pre-eminent) can never be sufficiently admired; and from Mr. Britton not having illustrated this cathedral, the work is the more highly valuable. The publications by the same accomplished artist, on the Cathedrals of Worcester, Litchfield, Chester, York, and Canterbury, are also excellent though inferior to that upon Lincoln Cathedral. The twenty-four views of English and Foreign Cathedrals, by the same artist, are for their correct perspective, and pictorial effect, highly valuable to the architect, and from their exhibiting the perfection of *picturesque massing which the Gothic Architects so profoundly understood.* The two series, consisting each of twelve beautifully etched outlines of Continental Architectural Views, by the same artist, are also valuable to the architect.

255. WILKINS's (William, M.A. F.A.S.) "*Antiquities of Magna Graecia.*" Cambridge, A.D. 1807. This is an elegant and valuable work; and the learned author of it, shews some very strong points in favour of his hypothesis, that the form proportions and style of the Architecture of Solomon's Temple, were the types from which the Grecian Doric temples were derived. How difficult is the understanding of technical descriptions without graphic delineations, may be sincerely felt, by the attempts to produce a representation of Solomon's Temple, which are as different and as numerous as the commentators who have treated on the subject; although there are two different descriptions of it in Holy Writ, each of which describes every part of it several times over. Perhaps this difficulty may arise, from the description of it being given by a writer less inspired than Moses, whose account of the tabernacle gives one an almost perfect representation of it.

256. WILLIS's (the Rev. R.) "*Remarks on the Architecture of the Middle "Ages, especially in Italy.*" Cambridge, A.D. 1835. This work, is extremely valuable from its improved nomenclature of Gothic Architecture, and by its discriminating development of piers shafts arches and vaults, it forms many links in that complete chain which is now being forged for binding together the once-lost and still-scattered principles of Gothic Architecture. One can only wonder why the excellent author of it, should in part of his system, designate the mere point of communication between the pier and the arch, the *Impost*, instead of giving that term to the horizontal band or capital (if any) which is laid between the pier and the arch.

257. WOOD's (Robert) "*Ruins of Palmyra, otherwise Tedmor in the Desart.*" London, A.D. 1753. This work, is necessary to the formation of an architectural library; and although not all the architecture and ornaments of the magnificent remains of Palmyra are of the highest class, yet they exhibit much boldness grandeur beauty and elegance: the companion to this work, entitled, "*Ruins of "Balbec, otherwise Heliopolis, in Coelosyria,*" London, A.D. 1757, is also worthy of estimation: independently of structural excellence, and of its magnificent and celebrated masonry, the architecture of the edifices of Balbec is not to be despised for its ornaments; although it may contain some things which one would wish had been dispensed with, there is a greatness about these noble remains, which is truly delightful.

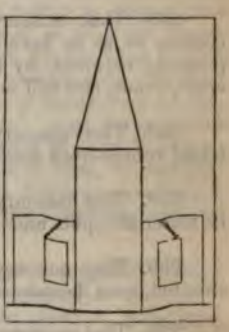
258. WOODS' (Joseph) "*Letters of an Architect, from France, Italy, and "Greece.*" London, A.D. 1828. This esteemed publication, though not a practical work, contains much information, and many observations upon the foreign buildings of Europe, which tend to enlarge the stock of information of an architectural student; and when will a real architect cease to be a student?

259. WREN'S (Christopher) "*Parentalia: or Memoirs of the Family of the "Wrens; viz. of Mathew Bishop of Ely, Christopher Dean of Windsor, &c.; but "chiefly of Sir Christopher Wren, Late Surveyor-General of the Royal Buildings, "President of the Royal Society,*" *&c.* London, A.D. 1750. This work, so much esteemed from its being almost the only authentic record left by the great Architect and his descendants, should be possessed by every modern architect: it is to be regretted that it does not contain more extended notices of the incomparable architect of the city of London, and of his works opinions and knowledge; but that little of them which it does contain, has ever been highly esteemed: the work is scarce and dear; and it is a matter of surprize and regret, that a cheap, new edition of it is not put forth.

CHAPTER XXIV.

Of Foundations.

260. THE foundation of a building, should be of such a nature, that it will bear without compression or flinching, the weight laid upon it.



261. If the soil under a building, be of a soft nature, it will of necessity yield or compress beneath the weight placed upon it; if the building be uniform, and be well compacted and tied together, this compression may not lead to very serious consequences; but if any part of the building, be loftier and more weighty than the other portions of it, as in the case of a church-tower or steeple, the soil beneath the extra weight will be more compressed than the other parts of the site; hence all that portion of the building, will be sunk something into the ground; and in thus descending, the masonry or brickwork, will break away from the adjoining work, which remains more at its original level: this is the case at the churches of St. James Clerkenwell, St. Leonard Shoreditch, St. Martin in the Fields, and in many other instances.

262. In proportion as the soil is of a soft and yielding nature, the footings of a building should spread; for if a square yard of ground will bear a ton weight with a certain degree of compression, two separate square yards will bear two tons weight with the same degree of compression, or they will bear one ton weight with only half the degree of compression, and perhaps less: on this principle, though a man in common shoes will sink by his weight into snow, yet with shoes with extended soles, which will meet with the resistance of a larger extent of snow, he can walk freely over the surface of it without sinking; and indeed upon a rolling soil, such as sand, a foundation of two united yards superficial, will bear more than two separate yards superficial,—for the soil can less readily roll away from the centre of a large plot, than from the centre of a small plot; for in the former instance, it has further to move before it can escape and fly up at the edges.

263. Gravel, next to unflinching solid rock, is the best foundation; for it does not flow and diminish in quantity, from water running through it.

264. The next best foundation is strong clay: in a confined situation, preserved from the heat of the sun, it is very certain; but in open country situations, during drought, it is apt to split, and cause fracture to the building, unless

the foundation be laid below the range of the fissures which occur in it. St. Paul's Cathedral, one of the very loftiest and weightiest buildings in the world, stands upon a layer of clay, only from four to six feet thick, above a quick-sand forty feet deep; yet, from the breadth and compactness of its footing, the goodness of its masonry, the equipoise of its several parts, and the masterly skill with which it is put together, it is freer from flaws and settlements than all other great buildings in the world, however good their foundations.

CHAPTER XXV.

Of English Masonry.

265. Of good English square masonry, nothing needs be said: no architect or mason, is so ignorant, as not really to know what good masonry is; it will therefore be better, rather to mention the nature of bad masonry, that it may be avoided by the architect, careful of his reputation, and jealously desirous that not one farthing of his employer's property may be foolishly dissipated.

266. That masonry is bad, which being neither laid in courses so as to have only a downward pressure, nor bound properly together, by the mere gravity of its materials, rolls apart, rends, and will not remain in a state of rest.

267. That masonry is bad, which bursts open, from internal rubble-work forcing out the external faces of the wall.

268. That masonry is bad, which by the friable nature of its materials, splits under its mere weight.

269. That masonry is bad, which however carefully and artificially constructed, soon decomposes, by the mere operation of wet frost air and time.

270. That masonry is bad, the materials of which, however good, fall to ruin by the faulty manner in which they are put together.

CHAPTER XXVI.

Of Cramps and Plugs in Masonry.

271. Of all the practical grievances, under which modern English masonry labours, none is more dreadful, than the absurd manner, in which cramps and plugs, are used for the purpose of connecting it together, but really to destroy it.

272. A building composed of good and honourable masonry, in ordinary situations, may be said to need no cramps; nearly equipoised and in a state of rest, scientific masonry falls together, almost as certainly as the particles of the earth fall to one common centre.

273. If masonry be not equipoised to a state of almost perfect rest, it is in vain that it be cramped together; neither cramps, nor girths, nor the cohesive

strength of the stone itself, will preserve it from irregular settlement and consequent fracture.

274. Where some other force, beyond that of mere gravity, is exercised against the masonry, as that of the waves of the ocean, or the current of a river, or where the masses of stone are light and may be easily removed by the hand of man, or by accident, cramps are necessary.

275. Cramps should never be of iron: the Author has never used one single cramp of iron, and he never will; he could produce such a catalogue of disasters and architectural destructions, merely from the corrosion of iron cramps, as would astonish any one previously uninformed upon the subject.

276. If cramps be used at all, they should be of some material which will not corrode; for iron, particularly wrought iron, unless buried a great way in the masonry, soon becomes so bossed round with rust, as to split in pieces the strongest masonry.

277. A large stone building, with its masonry cramped with wrought iron, has really thousands of wedges, silently, but powerfully, and unrestrainedly, operating its destruction.

278. The following observations relative to cramps, are taken from Wren's "PARENTALIA." Page 286. "*This has been observ'd, in taking out Cramps from "Stone-work at least four hundred Years old, which were so bedded in Mortar, that "all Air was perfectly excluded, the Iron appear'd as fresh as from the Forge.* "THEREFORE IN CRAMPING OF STONES, NO IRON SHOULD LYE WITHIN NINE INCHES "OF AIR, *if possible; for the Air is the Menstruum that consumes all Materials "whatever. When there is a Necessity to use Iron for Want of Stones large enough, "Care is to be taken to exclude sufficiently the Air from it.*" And even Wren's caution in this matter, does not appear to have been sufficient in every instance; or else the great number of his architectural works in hand at once, did not permit him, to see with his own eyes, that his intentions were fulfilled; for there is very little decay or injury come to his buildings, except that which has occurred by the corrosion of iron.

279. The following observations, are from James Murphy's magnificent work upon the church of Batalha, in Portugal. "*The spire of Salisbury, for instance, is "but seven inches thick; and that of Batalha is about the same thickness, independent "of the embossed work, though almost a fourth part of its superfices is perforated. "Great care must consequently have been taken, in selecting the materials employed in "constructing such light spires,* ESPECIALLY AS THEY ARE, I BELIEVE, IN GENERAL "CONNECTED WITHOUT THE AID OF IRON CRAMPS; FOR THIS METAL, WHEN EX-"POSED TO AIR OR MOISTURE, IS SUBJECT TO CONTRACT RUST, WHICH IN TIME WILL "SHIVER IN PIECES AS MUCH OF THE BLOCK AS IT COMES IN CONTACT WITH." "*Cramps of copper were also used by the ancients in their buildings, which, according "to the account of Father Montfaucon, were tempered to an extraordinary hardness.*"

280. Mr. Smeaton in his invaluable account of the construction of the Edystone Lighthouse (section 158), gives the following account relative to a stone steeple which was partly destroyed by lightning, January 25th, 1757. "The steeple of "the church of Lostwithiel before this accident was 113 feet high, whereof the "lower part was a square tower of 49 feet, finished above with an elegant Gothic "octagon lantern, 12 feet high, and above it a stone spire of 52 feet, of which a "portion of 20 feet of the upper part was entirely burst, and dispersed in all direc-"tions; and some of the stones that composed it were found at the distance of "200 yards.—The masonry, as is usual in ancient and well-built spires, was very "light, *the stones composing the shell of it being no more than seven inches thick; so "that the single stones of it could not in general exceed one hundred weight: yet as "they were all curiously joined together at the ends,* MORTOISE *and* TENON *fashion,* "and appeared to have been exceedingly well cemented together, nothing, as it

" should seem, but a great power of some elastic vapour, similar to the sudden " explosion of a considerable quantity of gunpowder, could have burst and dis- " persed the materials of the spire in the manner it had done: for besides the " part entirely destroyed, to six feet further down, one half of the shell was thrown " down, and the other half left standing, in so perilous a state, that it was judged " necessary to take it down; and in doing this, the work was found so disjointed " and shattered, that it was thought necessary to take down six feet more. It " was in this situation when I viewed it, the beginning of March; and I found " that the whole of the spire left standing, as well as the lantern, was greatly " cracked, and damaged. Many other circumstances occurred which shewed the " effects of an elastic vapour, that wanted to get at liberty by expansion, some- " what similar in its most obvious effects to that of gunpowder; and under this " idea, I might have been tempted to suppose, that had the shell or spire been " rendered stronger by cramping the stones together, as well as *tenoning* the ends, " it might have sustained the elastic pressure outwards, without being torn to " pieces: but there were some attending circumstances which convinced me, that " the action had not been altogether in the way of an included elastic vapour, " endeavouring to expand itself; upon which principle, the *weakest parts* would " have given way, and have afforded an opening to the vapour: for, at the bottom " of the steeple, at the level of the ground, an hole had been pierced entirely " through the wall, and through an opposite buttress, whose compound thickness " amounted to eight feet."

281. To the opinions of other eminent men, may be subjoined that of the justly celebrated Leon Batista Alberti, who, in the 11th chapter of the third book of his Architecture, says, " *Cramps and pins of iron are not reckoned amiss;* " *but I have observed in the works of the ancients, that iron rusts, and will not last;* " *but brass will almost last for ever. Besides, I find that marble is tainted by the rust* " *of iron, and breaks all round it.*" " The cramps must be so placed that no drops " of rain may penetrate to them; and it is thought that the brass ones* are yet " more strengthened against old age, if in casting they are mixed with one " thirtieth part of tin."—*Leoni's Translation.*

282. There no longer remains any excuse, for using any but cramps of copper, bronze, or gun-metal. From the vast increase in the world, of the stock of the precious and other metals, the incomes of workmen and of their employers are now apparently so great, that whereas in the reign of King Edward the Third *a single pound of iron* cost nearly the diurnal wages of a labourer, now *a pound of copper* does not cost above one third of the daily wages of such a labourer: and moreover, even in the reign of Edward the Second, although ties of metal which would not corrode, might have been deemed too expensive, yet it appears that at the palace of Westminster *iron ties with tinned heads* were made use of.

283. Thus it may be concluded, that at the present day, with the present experience, and at the present prices, no one can use iron cramps in masonry, without justly incurring the charge of ignorance, or of self-willed obstinacy. The author has not himself been without chagrin upon some occasions, when after he has elaborated a specification, with directions the soundness and economy of which, observation upon the defects of existing structures has fully proved to him, to find that from some uncontrollable circumstances, his work has fallen into the hands of some vain, ignorant, or unprincipled man, who, besides the other intermeddlings of destructive folly, has exchanged his direction for the use of copper or gun-metal in connexion with stone, into orders for the use of corrosive iron, and has thus set wedges for the cleavage of that Building which had perhaps till then escaped the violence of time, and the artillery of civil war.

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* *Brass*, would here be probably translated better by *copper*. That ordinary brass does not stand in the weather so well as copper may be seen even in so small an article as the Thermometer, the bridles and screws of which, last long if made of copper, but which quickly decay if made of brass. A portion of tin mixed with cramps of copper renders them both harder and more durable.

284. The considerate *practical* reader will recognise with a smile, with esteem, with confidence, and with delight, the prudent observations upon this subject, of the honest, inventive, and in his time the courtly De L'orme. " Soubz ombre du fer & du plastre, " ilz ont esperance que leur ouurage tiendra trop. I'ay ueu aduenir un autre grand mal aux bastimẽts pour mettre du fer dans les " maçonneries & auec les pierres de taille : car le fer s'enrouille, & " s'enrouillant il s'enfle & faict rompre les pierres & murs qui ne " peuuent durer longuement. De ce nous prendrons par exemple, " le Liarre, duquel les racines liees & prinses dans les murs attirent " & rongent la substance du mortier, & comme elles deuiennent " grosses, se font faire place, reculant les pierres qui n'ont plus de " mortier, & par ainsi les rendent prestes de tomber. Quoi, uoyant " aucuns en ont faict cest diuise, *Inimica amicitia*, qui est à dire, " ennemie amitié : ou, ce qui m'aime me ruine. Ainsi est-il du fer, " lequel les meschantes maçonneries aiment de peur qu' elles ne " tombent, mais à la fin il les ronge & ruine. Faisant tout ainsi que " ledict liarre, lequel apres auoir acheué de ruiner la muraille, & " l'auoir mise par terre, n'ayant aucune chose pour se soustenir, est " contrainct de tomber sur le chemin. Auquel, apres auoir marché " dessus, est couppé, pour les empeschemens qu'il peult faire : & " par insi il meurt comme il a faict mourir le mur. Chose sem- " blable aduient à aucuns hommes, qui soubz ombre d' amitié, ap- " puis ou alliances auecques autres, ilz en tirent leur substance, & " les font mourir d'ennuits & pauureté, pensants y gaigner beau- " coup : mais apres auoir succé & attiré d'eux iusques au sang, ilz " trebuchent & sont mis à neant par le uouloir & iustice de Dieu, " qui ne ueult le mal demeurer impuny.

" Inconueniens " qui aduien- " nent pour met- " tre du fer à la " maçonnerie."

" Nature du " fer auec les ma- " çoneries."

" Faulte q " font les maçons " usans de fer aux " bastiments."

" Philibert de L'orme. Novvelles Inventions " povr Bien Bastir." Paris, A.D. 1561. cap. iv. folio 6.

CHAPTER XXVII.

On the use of Iron in Stone and Brickwork.

285. In general, the architect must fear to attach any iron-work whatsoever to stone-work, or even to let it touch it ; but he needs not take the same pains, with regard to attaching iron to brickwork : buried in brickwork, very little if any change in it takes place ; nor does it appear that brickwork is injured by it : but he should take care, that no iron-work, particularly if wrought, should at its issue from brickwork, cause rust-stains to the facing-work, more especially if of white bricks.

286. The wrought-iron discharging cradle-bars, which the author has placed over stone window-heads, he has had soldered up completely in a sheathing of milled lead, to prevent corrosion, or the imparting any stain to the stone-work ; and where he has placed such cradle-bars, he has afterwards, neither observed rust, nor breach of the stone heads : but even the slightest settlement or yielding of those bars, would have broken the stone-work beneath them, if there had not been an arched hollow space, left between the iron and the stone ; which space, after the building had settled, was merely concealed by an extremely thin face-work, set in a great deal of very soft mortar, on purpose to yield in case any further settlement should occur.

287. Perhaps if the cradle-bars were heated, and pitched all over, they would need no other preservation from rust; and common red sealing-wax, applied to hot iron, appears to form a perfect anti-corrosion varnish, which neither cold nor great heat will destroy.

288. The author, has had the ends of wrought-iron railings, filed smooth and tinned over, when inserted in stone-work; but this is very expensive, if applied on a large scale.

289. How injudicious, is the exposure of iron in situations where its corrosion and destruction may lead to serious consequences, may be seen in the steeple of Saint Mary-le-bow, London, where there is a wrought-iron chain-bar running through the shafts of the Peristylium; this chain-bar, is in a great measure destroyed by rust; and two of the columns, are split by it, through the body of the stone, and are at present only held together by girths of iron: this defect, will in the end, lead to a very expensive further repair and restoration of the steeple.

290. The author, had some time since, to survey a steeple, and to make a specification for the repair of it; this steeple, had two exposed chain-bars of wrought-iron, running through the eight piers supporting the spire of it; these were found considerably rusted: he therefore deemed it requisite, that means should be taken, to prevent their further injury, especially as the foundation of the steeple, was defective, was ill-drained, and had been badly dealt with; the means proposed were to file them clean, to heat and pitch them over, and to encase them in sheet copper. This proposal was approved of; but after several years' parochial contention, by a strange inexperience and weakness of judgment, these precautionary provisions were removed from the specification. But none of the work has as yet been performed.

CHAPTER XXVIII.

Of the Cheapness of Granite for the Facing of Ordinary Buildings.

291. MEAN in its buildings, but truly sumptuous in its pavings, London is a surprise to most strangers.

Paving of undressed, but square granite, nine inches deep, is provided and laid down at about one shilling per foot superficial: now allowing for the extra price which is paid for the facings of brickwork, and deducting an average of nine inches from the thickness of the brickwork, it appears that the plain parts between the decorations of churches and other public buildings, may be faced with regular courses of granite, unpolished it is true, but almost everlasting, and better wrought and smoother, than the rubble-work of most Gothic churches, and that at the same price as our present mean brick-work; but if instead of with courses of square granite, we were to face our walls in the ancient manner, with the "*Opus incertum*," small irregular granite could be brought to us as ballast, at a price cheaper than that of any kind of stone which we at present use; and in Villas and many other Buildings, it might by judicious use, be made

Section of brickwork faced externally with rough blocks of granite in courses 6 inches high, and alternately 12 inches thick and 6 inches thick, so as to form an average thickness of 9 inches.

to appear very picturesque, by forming it in courses thus, with quoins of squared granite, or of other stone: and granite curb eight inches thick, and squared all round, costs only two shillings per foot superficial. Indeed, walls may be built in London, of superb masonry, twelve inches thick, wholly composed of solid blocks of squared granite curb, of excellent bond, being in blocks five or six feet long, at three shillings per foot superficial; while walls one brick and a half thick, faced with yellow bricks, cost fifteen pence or more per foot superficial.

Elevation of a kind of granite "*Opus incertum*" masonry, ranging in courses with quoins of squared stone.

The granite may be brought from Scotland, or elsewhere, of the exact required size, without the enhanced expense of the high-priced labour of the metropolis.

But it seems, some do not value granite, for lately passing through the area of the Bankrupts' Court, London, nearly new, the author observed workmen, bestowing that labour which might almost have polished the granite piers of the arcade, absolutely employed in tearing away their surfaces, to receive a coating of plaster, as if more indicative of bankruptcy and ruin.

CHAPTER XXIX.

Of the Injury which has fallen upon English Architecture, from the Extensive Use of Bath stone; and of the difference between good stone and bad stone.

292. Perhaps one of the most fatal events for modern metropolitan architecture, and for that of a considerable portion of the remainder of England, is the repute into which, in modern times, Bath stone has come: of all building free-stones, it is perhaps the worst; it is naturally of so ill a color, is of so seamy and coarse a texture, is so porous, and so readily becomes still darker and more disagreeable in color, is so soft and of so fragile and rapidly-decaying a nature, that however little it may cost to work it, that little, may be justly considered to be thrown away: of the churches, which have been built within less than the last twenty years, wherever this material has been made use of, hardly one exists, in which more or less dilapidation in the stone-work, has not already taken place: the restorations of Henry the Seventh's Chapel at Westminster, only just finished, of the very choicest and of the most carefully selected specimens of this perishable and grim material, are it is to be deplored, already crumbling away, while the original sub-plinths of the building, being of a harder material, have after 300 years, suffered little from the tooth of time. The columns, bases, plinths, cornices, balustrades, and other work of Bath stone, with which the Regent Street and the new buildings of the Regent's Park, London, have been pretended to be decorated, are already in numerous instances, in only ten or twenty years, arrived at a frightful degree of decomposition; indeed parts of the columns of the park-lodges, near the Regent's Circus, have already fallen to dust; already are the columns of All Souls' Church, Langham Place, fretting away, and the stone casing of the tower of the same church is flawed in many places. If any one, be really unacquainted with the ungenerous nature of the competition, between the brilliant and admirable quarries of Portland roe-stone, and the doleful ones of Bath, let him compare the superb masonry of the water-front of Somerset House, built about fifty years since, with that of the building at the opposite corner of Waterloo Bridge, built about fifteen years since, and which is a chosen specimen of its kind.

293. Greatly is it to be regretted, that the restorations now going forward

on the outside of Westminster Abbey, should by a weakness of judgment, and an absurd pretended economy, be made of perishable and grim materials: if any one doubt this, let him from Saint James's Park, view the beautiful color of the towers and parapet of the Abbey, which are of Portland stone, and compare their cheerful and brilliant appearance, with the rusty-iron-colour of the new work. Above all, he will deem it sad retrograding, to exchange the present plain embattled parapet of hard white stone, the simplicity of which is in accordance with the plainness and sobriety of the other parts of the fabric, for fragile monotonous perishable parapets of quatre-feuilles without frame-work*. The author knows not whether the exchange of good hard white stone, for grubby soft stone which almost decays while under the very workman's tool, be made with public money, if it be, it most unquestionably calls for parliamentary interference, lest the same plague befall the western towers, which though faulty in details and in some of their masonry, are nevertheless, magnificent in proportion, and brilliant in color and effect, needing rather repair and correction, than universal impoverishment.

294. If any one would behold in an eminent degree, the difference between good stone and bad stone, let him look at the towers of two churches, both built since the great fire of London in the year 1666, viz. that of Saint Margaret Lothbury, and that of Saint Bartholomew, both near the Bank of England; the former remains without the slightest crack flaw or decomposition, and is more beautiful from time; the latter, has completely lost its original surface, has assumed in every part a strangely rough and shaggy appearance, and would pass for a building as old as the time of the Romans, and it appears even more decayed than one of that age: these are both the work of Wren, who in the former instance, no doubt had the selection of the material, but was denied it in the latter.

St. Bartholomew's Hospital, London, built by James Gibbs, is also a memorable instance of the folly of using perishable and ill-colored stone: the whole of the ranges of buildings around the court of this extensive establishment, although built only about two thirds the time of Wren's buildings, are in the most lamentable state of decomposition; the surface of the stone-work being almost universally fretted away; the string-courses cornices and other projections, are generally broken, and are in some instances wholly perished; the exterior of the buildings having assumed the color of soot; considerable repairs have been performed to their masonry, and some of the balustradings of the buildings have been wholly removed,—while the stone-work of the two hospital-

* A question may justly arise whether the mode in which the parapets of Westminster Abbey are being changed, is in the proper *Early English Style* of the remainder of the original fabric. The shallow recesses round the interior of the Chapter-house of Canterbury Cathedral are surrounded by a sort of ornament resembling a parapet in relief, something like the new parapets of Westminster Abbey: this is a chaste and an elegant example, but being against a wall it does not appear flimsy. The *Quatre-feuilles* used in the Early English style of architecture are usually set within square or lozenge frames, as in the front of Salisbury Cathedral. The imitation of a parapet in the Chapter-house at Canterbury, is of doubtful era, from so much work having been performed to the Chapter-house in times considerably subsequent to its first erection. The continuous ornament of *Quatre-feuilles without frames* belongs usually (if not always) to the more flowing and decorated architecture of a later period: thus it occurs round the interior of the Clerestorial windows of the choir of Lichfield Cathedral, and upon the octagonal turrets of the gateway of St. Augustine's Monastery at Canterbury: it was used round the head of a doorway at St. Stephen's Chapel, Westminster: both *Trois-feuilles* and *Quatre-feuilles, without frames*, are to be met within the strings and cornices round the interior of the last-mentioned chapel: such *Quatre-feuilles* are to be seen round the head of a Tracery-screen (much resembling in some parts of it, the windows of Lichfield Cathedral above-mentioned) which has been filled in beneath a Norman arch in the southern transept of Norwich Cathedral: in the Presbytery of Winchester Cathedral, two rows of such *Quatre-feuilles* are used to form a breast-work to the Triforium at the feet of the clerestorial windows: the last-mentioned description of ornament is to be found set perpendicularly under two statues in the gorgeous doorway leading to the Chapter-house of Rochester Cathedral: and a range of *Trois-feuilles without frames*, and surmounted by a small battlement is to be seen in the screen inclosing the choir of Canterbury Cathedral.—None of the examples here stated, are of the Early English Style of Westminster Abbey. The expanded flowers wrought over the spandrils between the arches of the example at the Canterbury Chapter-house, indicate a style prevalent in the reign of Edward I., and are to be found in the crosses erected to the memory of Queen Eleanor subsequent to A.D. 1290: these certainly in application resemble the workmanship upon the Triforium spandrils of Westminster Abbey.

gates next Smithfield, and that of the church of St. Martin in the Fields, built of Portland stone by the same architect, are scarcely affected by time, and remain of the most beautiful color.

The author has heard it asserted, that the stone of Saint Bartholomew's Hospital was the pious gift of a benevolent benefactor; he knows not whether this be fact, but certainly whether given or bought, the hospital could hardly have obtained a more mischievous gift or purchase.

But so perverse is the spirit in architecture at the present day, that not only are excellent kinds of stone neglected, but they are even maligned; and there are not wanting those, who while they expect eternal duration from inferior stones, such as those from the quarries of Bath, which decay even in a short period of their lives, and which very rarely acquire that hard crust which they pretend they do,—yet very busily pick in imagination into separate granules, the hardest granite, although in ancient works two or three thousand years old or more, they can scarcely find any decay in it.

CHAPTER XXX.

Of the Extra Caution required in Building Edifices with Square Stone.

295. So guarded must an architect be in the erection of edifices of large square stone, the various blocks of which are accurately fitted together, so that one stone cannot alter its position without disarranging many, that all his attention is called into the most active play, to guard against every irregular settlement and subsidence; for the materials not being flexible, but friable, most certainly break and rend in coming to a state of repose, which the enormous weight of materials in even a very small building cannot effect, without great strain and powerful effort: even the stone window-sills of a prison, one or two feet thick, and though they scarcely enter the piers at the sides of them, from being pinned in tightly, often crack in the middle; and not unfrequently, a small piece is rent perpendicularly from off each of their ends: this may be observed in the Compter in Giltspur Street, London, and in many other instances.

Much of the firmest ancient masonry, consists of very small blocks of stone, set with rather coarse joints in a considerable quantity of mortar, which the stone has well imbibed: of this description of work, were formed many of the ancient Gothic vaultings:—and to this day, upon digging almost any where into the ground in the neighbourhood of the destroyed Priory of the Knights Hospitallers, at Clerkenwell, vousoirs of the arch-ribs of that building, are constantly disinterred: these are in general not more than 5 inches long, are in perfect preservation, and though wrought with very great precision, are not arched, their shortness enabling them to be set to the proper curvature with apparent exactness; while the frequent recurrence of the mortar-joints between them, has preserved them from fracture by settlement*.

In building with squared stone, too much care cannot be taken to prevent the different courses of the masonry from touching each other externally; for if this precaution be not taken, the external face of the stone-work will certainly be splintered off: where the stones are heavy, as in the case of columns, damage of this description is most effectually prevented by the interposition of plates of lead in the horizontal joints, leaving the joints open half an inch back, or more, and pointing them up only when the work has found its full state of rest.

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* The mouldings of these vousoirs, are in profile similar to the arch-ribs of the fine ancient crypt under the existing Church of St. John the Baptist, at Clerkenwell, which is formed out of the Choir of the old Priory Church:—the author has in his possession, an ancient capital bearing upon it the remains of gilding: this was found with other fragments of the Priory, which had been used as rubble in a badly-constructed wall, erected about 100 years since, to inclose the north side of the present church, and which wall having become ruinous, the author had to rebuild about two years since.

CHAPTER XXXI.

Of the Comparative Expense of Stucco Brick and Stone.

296. The following is an account of the annual burthen of brickwork, stuccoed externally.

In the year 1825, a friend of the author, built a house; he paid for every superficial foot of brickwork 13½ inches thick, 12*d.* and for every foot of external stucco upon the brickwork, 6*d.* so that the annual interest at five per cent. of the money expended at first upon each superficial foot of work is nine tenths of a penny. Two years afterwards, finding that from the metallic oxides in it, and from other causes, Parker's cement stucco, would not retain distemper-coloring, he had it painted four times with oil color, for which he paid one shilling per yard superficial, besides a charge of 6*d.* per yard for raising a scaffold, cleaning the work, stopping the cracks in it, and in wholly renewing parts of it, which made the then outlay amount to 18*d.* per yard or 2*d.* per foot superficial; this outlay lasted, till three years afterwards, another scaffold was raised, when it was found that the paint was in many places wholly fretted away, more cracks were observed, and some of the stucco had perished; and besides the cleaning and repair of it, three coats more of oil paint had to be laid upon it; the whole cost of this fresh application was 1½*d.* per foot superficial, and it lasted only three years, at the end of which time the same operation had to be repeated at a like expense; independently of which, from the fragile nature of stucco, the whole requires to be renewed, at a comparatively short period after the first application of it: thus it appears, that the annual interest of the money expended in the first outlay, for a superficial foot of brickwork 13½ inches thick, stuccoed on the outside, added to the annual burthen of keeping it in repair, is not less than 1½*d.*: and indeed many shop-keepers who have stuccoed fronts to their houses, have them colored or painted every year; and some kinds of stucco, such as mastic, are found after ten or fifteen years to be wholly decomposed.

297. Now a superficial foot of brickwork, faced with the very best white or yellow bricks, will cost only 18*d.* reckoned at very liberal prices; this will scarcely require any repairs during twenty or thirty years; therefore 1*d.* per foot superficial, is the utmost annual cost of the first outlay and subsequent burthen of repairing good brickwork 13½ inches thick.

298. If work be faced with courses of granite, of an average thickness of nine inches, bonded well into the courses of the brickwork, (as described in § 291) the expense of such a wall, will be rather less than one faced with superior bricks, while the duration of it will be such, that like the masonry of our ancient church-towers, it will hardly require any repairs in several hundred years: the annual expense of such a wall, will therefore be less than one penny per foot superficial; while such masonry, will be honorable, architectural, and picturesque, and even better than that of Windsor castle, within which every king on earth would be glad to dwell.

299. If walls be entirely composed of square granite curb, 12 inches thick, the work will only cost per annum 1¾*d.* per foot superficial; or less than some plastered work, such as mastic, really costs; while its surface will remain unimpaired after mastic has been fifty times renewed.

300. An ordinary brick wall 13½ inches thick, faced with Bath stone, with a coarsely dragged surface, costs as much as such a wall of solid granite; and till the dishonorable competition began in London, between Bath stone and Portland stone, the expense of Bath stone was nearly one half more.

301. Competition has brought the price of Portland stone to about the same as that of Bath stone: and the author has even been informed by masons, that they have sometimes estimated it, at less than Bath stone; the only extra expense, being in the labor, which in general costs about one half more. But this competition, has lowered the quality of all the kinds of stone, which it is thought worth while to bring into the market: yet it may in general be taken as a rule, that even independently of color and fitness for architecture, the worst block of Portland stone is better than the very best block of Bath stone.

CHAPTER XXXII.

Of the Degradation, which the General Use of External Stucco has brought upon Architecture, and how it has Tended to Ruin both Taste and Constructive Excellence in English Building.

302. Low, very low, is the abasement which the extensive use of external stucco has brought upon English architecture. In cases where no one would formerly have thought of building otherwise than excellently, this pernicious usurper, has tyrannically confined to the quarries, those illustrious materials, which might have reigned for many a century in glory over the architectural kingdom of England; the consequence is, that while the meanest embellishment is grudged to our public buildings, the unsubstantial dress of stucco, is thrown in all the extravagance of depraved fashion, over our private residences; the richer in gaudiness, the richer in architecture, is esteemed the work: hence, in many cases all taste is gone. But in the constructive goodness of buildings, the most sensibly is the injury felt; the quality of the materials, and the science of their adjustment, are rarely now of importance enough, to influence that which is to be concealed by stucco: but many a crack and flaw, shews that stone cannot be successfully imitated; and a Palace or a City Hall, composed of mortar painted with oil-colour, has more the appearance of a model formed of glaziers' putty, than of any one of those glorious ancient stone edifices, which with their intrinsic solidity, their jewel-handed embroidery, their rational structure and adornments, bear to the mind of the most ignorant the impress of goodness, and which amid their silence seem to say, "These were wrought by the generous-hearted who "boasted not in their day and whose names are now unknown, while in your "present age of architectural loquacity you produce nothing that shall survive "your short-lived personal records."

CHAPTER XXXIII.

On the Proper Occasions for the Use of External Stucco.

303. External stucco, may be very proper, for the garniture of an *old* house, *too old* to be worth a more substantial restoration: it may be proper, for a short-lived country pleasure-house, which caprice may in a few years render unestimable: external stucco, may be very fit for the investure of a theatre, which may be speedily consumed, or upon which, and upon all connected with it, a few years may bring bankruptcy: but external stucco, smeared over a cathedral, or other valuable national heir-loom, is profanation: external stucco, laid over

hospitals and other public institutions, is the most certain instrument for dissipating those funds, which put out to interest for a very few years, would swell sufficiently, to perform something which would rival the best works of the ancients.

Hittorff the French architect, in his pamphlet published last year relative to the restoration of the apex of the celebrated obelisk of Luxor, now re-erected in Paris, has the following amusing observation :—" Depuis que le précis qu'on " vient de lire est composé, il a été décidé que le Pyramidion de l'Obélisque de " Louqsor serait restitué en mastic. Cette restitution, dont les pluies et les " gelées feront sans doute prompte justice, offre par cela peu d'inconvéniens, " puisque, sauf les frais d'un nouvel échafaudage, ou pourra toujours en revenir " au bronze doré." The indignant artist, could not have more severely satirised the placing a peruque of plaster on the head of the aspiring antique, for he knew well that the cost of the scaffolding would form the chief expense of such a work.

CHAPTER XXXIV.

Of the Possibility of Procuring Stone-quarries at London, and Near Other Great Cities.

304. For the mere consumption of fuel, it is not thought too far, to send several hundred miles, and to dig an enormous distance into the earth ; but for the stability and adornment of lasting public buildings, such labor is looked upon with a grudging eye. The author does not profess to be fully acquainted, with the various strata which are to be found lying in the immediate vicinity of London ; but it does strike him, that stone might be provided in abundance ; the depth at which it may be procured may be great, but it is probable (though granite may lie too deep) that good lime-stone, may be procured in sufficient abundance, for all purposes of building, and at less expense than bricks.

305. He or they, who would embark capital, in such an undertaking, it is little to be feared, would be handsomely repaid, by the general demand in which the produce of their works would be held ; thus London, from a city of the meanest and most fragile materials, might become the grandest and the most substantial city in the world.

306. At present, so fallen is the good old style of building, that what little stone *is* used for anything but paving, which is on a truly noble scale, seems as it were, weighed and subdivided by a microscope.

307. He who would undertake such a pursuit, would have his name handed down to posterity, with that of Sir Hugh Myddelton : and the outskirts of London, would be saved from much of the nuisance of brick-making : and another most serious evil, would be avoided ; for at present, a large proportion of the sites of new buildings, are previously ruined, by the original compact soil being worked out, by the brick-making process ; and thence all the buildings put upon them rend and fracture in all directions.

308. On the subject of the depth at which free-stone may be found beneath London and its neighbourhood, are here quoted the remarks of Mr. John Middleton of Lambeth, published by him in the *Monthly Magazine*, Jan. 1813. page 311, vol. 34.

" The chalk stratum passes under London, at the depth of three, four, or

" at the most within five, hundred feet. It is said, that the chalk stratum was " found at the depth of one hundred and eight feet, in sinking a well at the " Victualling-office, Deptford. It gradually rises to the surface in about ten " miles, as at Croydon and other places; it then lies immediately under a thin " vegetable mould, and continues to ascend for eight or ten miles more to the " south; there it has attained its greatest height, and forms a range of stupendous " hills on the north side of the towns of Folkstone, Ashford, Maidstone, Wro- " tham, and Westerham, in Kent; Godstone, Reigate, Dorking, Guildford and " Farnham, in Surrey; as well as on the north side of the South Downs, in Sussex; " and above all the precipices of chalk stratum in England. Indurated chalk " stained with iron for Dorking lime, (a rock which is supposed to be nearly " equal to Portland-stone, and fire-stone) may all be obtained wherever there is " chalk. Where that stratum rises into high precipices, these things may be " obtained at the easy rate of quarrying near the bottom of such steeps; and in " all other parts of the chalk stratum, by sinking a mine to the place where they " repose, near and at the bottom of it. Some persons have sunk to an equal " depth in chalk for water, and have obtained it. There are many places, as Clifton " near Maidenhead, on the Thames, and others between that place and Henley, " in which the raising these stones would be a profitable undertaking, especially " to the owner of the soil. At Denbys, near Dorking, Surrey, Mr. Jonathan Tyers " sunk such a well, on the top of that high hill, to the depth of four hundred and " forty feet, and there obtained a full supply of fine water; if the object of Mr. " Tyers had been stone, he would have found it at the same depth."

The time may come when, through an increased knowledge of geology, quarries may be opened in the immediate neighbourhood of many cities which are now confined to the use of bricks, or which can alone procure stone, at the heavy expense of distant carriage.

CHAPTER XXXV.

Of the Quantity of Material Requisite in a Building.

309. Much ignorance has been in modern times abroad in the world, of the great quantity of material, requisite to be employed in rendering a building successful; *wisdom in putting it together*, does more than the *quantity* of material.

310. A Gothic architect, has built a vault only a few inches thick, which has lasted five or six hundred years unimpaired; and has saved purse, walls, piers, and foundation, alike from a heavy burthen: but a modern vault of immense thickness, has either fractured instantly, or has thrust out the walls, sunk the foundation, and led to a rebuilding of the whole structure.

311. Five hundred years ago, the stone spire of Salisbury Cathedral, was carried up to a height which few human works have ever attained, and has ever since resisted storm tempest and lightning; and if violence be not used against it, may last as long as the pyramids, though compared with them it is almost as light as a feather: but the more cumbrous dome of Saint Peter's at Rome, has from its want of equilibrium, split desperately in five hundred places, from its crown to the foot of its supporting peristylium; and many modern small steeples, from that and other causes, have required to be rebuilt, in less than an hundred years from their first construction.

312. The exercise of wisdom, empowered the carrying up of the proud spires of Friburg, Vienna, Strasburg, Antwerp, Chichester, and Norwich; the decay of constructive wisdom, compelled the intended western campaniles of Saint Peter's to remain unbuilt, the foundation of the church to be relieved from their rising burthen, and the façade of the building to remain to this day the largest but meanest on earth.

CHAPTER XXXVI.

On the Disregard paid to the Duration of Buildings, notwithstanding the Great Increase of Chemical Knowledge.

313. It is a melancholy reflection, that in this age, in proportion as the scientific knowledge of architectural construction advances, *as the chemical properties and the duration of materials become better known*, the actual practical building of this country, rich by nature and political position, retrogrades sadly both in goodness and wisdom; and the improved *chemical knowledge* of our time, seems employed for little else in building, than *the discovery of what materials will most readily perish*, when exposed to the bleak atmosphere of our northern climate: and not only will these remarks apply to private edifices, but even to buildings of a public nature, which belong to those permanently founded institutions, which being endowed with landed estates, and large funded property, certainly make an improvident use of their means, in building that which after a few years must be renewed.

314. The truth is, the durability of a building, is that which is at present the least thought of: a design is chosen, into which every description of finery is introduced; the extent of outlay is previously determined, without regard to either the size or the nature of the intended work; if for that outlay, the design can be executed in granite oak and bronze, it is so executed; if it should appear, that the limited amount will only provide a building veneered with soft and ill-coloured stone, the estimate and design are thought to be equally good; if it appear, that plaster only can be afforded, the professional man's accuracy, and knowledge, go unimpugned; but if the estimate will neither afford brick nor stone, high then will the architect rank for talent, if he can discover a composition, which while it saves half the outlay requisite for brick or stone, is *said* to be equally durable, or more so.

315. He who courts future fame, for his constructive knowledge and accuracy of calculation, will act differently; and will be very shy, of adopting any new wonder-working invention, before sufficient trial: for some ages, many inventive geniuses, have endeavoured to make in a few hours, stone rocks, upon a scale sufficiently large for the purposes of architecture; but every attempt, hitherto, has proved that so short a time has not yet sufficed to do that which has taken nature thousands of years.

316. The science of geology, tells us, that we have rocks enough; and the witless folly of man, (or something in lieu of it) were better employed in procuring those already made, than in adding to their number.

CHAPTER XXXVII.

On the Modern Bad Choice of Materials, their Ugliness and False Economy.

317. One of the worst imperfections in modern architecture, is the patch-work mode of composing the exteriors of buildings, of many different kinds of materials, which combine ill together in color and nature: a most memorable instance of this, is the palatal *caput mortuum* of a million of money, in St. James's Park. Of everlasting granite, and ephemeral soft stone; with figures of pale milky marble, and columns of rusty cast iron; the union of bright Portland stone, with grubby Bath stone and brown terra-cotta; if any jumble of materials could make architecture resemble the image of Nebuchadnezzar, surely it is to be found at Pimlico: and that which shows further weakness of judgment, is the circumstance, that while amid the extravagant profusion of this unfortunate palace, a sorry pretended economy, has induced the use to a large extent of very perishable materials, a sum much more than sufficient to have paid the difference between the price of good materials and bad materials for the whole building, has been expended in the folly of a triumphal-arch, before the palace, of marble, which in this climate, though the most costly, is the least durable of all descriptions of stone; and which arch, if ever finished, would require a glass-case over it to protect it from the weather.

318. If in a palace, where no expense has been spared, such be the unfortunate result, what may be expected in buildings of an inferior class? Few, very few, are indeed the buildings now erected, of which a man may honestly say, "The design is good, handsome, and harmonious, and so are the materials of the work." With all the *intended* parsimony, a *practical* extravagance is really fallen into, and that for the production of mere ruins of an ugly aspect.

CHAPTER XXXVIII.

Of the Prevalent Perverse Spirit by which in Modern Times, Materials the Least Proper for the Duration of Architecture are Employed in the Various Parts of many English Edifices.

319. In modern times, another gradation in the decline of English Practical Architecture, ensues from the bad adaptation and choice of materials.

320. So perverse is the evil spirit that reigns over this, that in myriads of cases, the materials chosen for a work appear to be such as would have been naturally selected for avoidance.

321. Thus the Building-act forbidding, in London, timber joists to be carried into party-walls, they are generally carried from back to front through a house; hence they should be borne on unflinching supports; the central cross-divisions of the house, should be of substantial brick-work; but this is in at least nine tenths of all the London-built houses, merely a slight partition of timber, which containing in its fashion every structural fault, yields beneath the burthen, and the whole system of floors and roofing puckers in like a falling sheet. A timber partition, may be scientifically formed so as not to yield; but then, with all its science, it will easily rot and burn, neither of which will a wall of brick-work or masonry.

322. Again, Iron is in modern times used in improper situations, under a pretence, that a beam of cast-iron will amid a dreadful conflagration remain proof: this is not so; a mere beam of cast-iron, amid the fury of the element is only, as it were, like a poker immersed in a grate of ardent coals; becoming speedily heated, it increases the unrestrained burning, and with the approach of the least water, the treacherous beam snaps, and adds to the damage.

We have even seen in the present day, the stone lantern of a public edifice, supported upon cast-iron beams, which it tends to snap, and which will bear no fire,—instead of being raised geometrically, so as to consolidate and hold together its supports.

323. But the worst property of cast-iron beams, is their uncertain nature; frequently, though they will bear considerable weight in an inert condition, the least addition to that weight, or the least tremor given to them, will break their substance, and cause perhaps besides destruction of property, loss of life or limb. The only legitimate and scientific use of cast-iron in buildings, is the subjection of it to *compression:* nearly all the instances of its use in modern architecture, where it is subjected to the cross-strain of its own gravity and to that of a heavy additional load, savor strongly of a decline of art and skill.

324. In ground-floors in contact with damp, cast-iron beams laid upon wall-plates of stone or iron, are well applied; for a floor so constructed, will last long: but by fatal perverseness, this useful application of cast-iron is rarely made: the author, wherever he has so applied iron, has found the most successful result.

325. Cast-iron Breast-summers will not easily decay by rot; but under fire, they are far less certain than even those of wood. The author has surveyed many houses after conflagration, but he never remembers to have seen even one wooden breast-summer wholly destroyed,—for being near the bottom of a fabric, and too thick to ignite entirely, they are hardly ever consumed through.

326. By London-bridge, occurred at one of the new houses, perhaps the first fire where cast-iron fire-proof breast-summers had been used.—The building had three of them, and two of these snapped by the action of the fire and water; and the external brickwork of the fabric, was entirely ruined. Again, near Charing Cross, another fire occurred, at a house where cast-iron breast-summers had been employed; here, too, the brickwork was ruined, and had to be rebuilt.—There is no probability, that in either of these cases, the brickwork would have fallen if breast-summers of wood had been made use of.

327. But the whole system is wrong.—Columns or piers, and arches, of masonry or brickwork, ought to be used; by this the weight would consolidate the voussoirs of the arches: at present, the weight makes the breast-summer droop down; the wood, in drying, assumes a smaller scantling, and the brickwork becomes crippled as may be seen more or less in most instances where breast-summers of wood have been employed.

a—b. Height of the Timber Breast-summer when first placed in the building.
a—c. Height of the Breast-summer when shrunk.
d. Brickwork over the Breast-summer, which has fallen by the shrinkage of the timber.
f f. Fracture in the wall, caused by the brickwork *d*, falling from the brickwork *e*, which is sustained by the pier *g, h.*

[See the Index for more on this subject.)

CHAPTER XXXVIII.

328. Again, the whole system of Doming, Arching, and Groining, with ribbed cradling of wood, is wrong: it is unskilful, it is unhonourable, it is very costly, it is subject to destruction by fire and by rot, it is unsound, the shrinkage of the wood spoils the plastering put upon it, but it is used because it is thought, *falsely*, to be economical.

329. Take the instance of the domed ceiling of the Lowther Arcade, London. The lines of this are formed skilfully; it exhibits a proper knowledge of the sections of domes, and of their useful adaptation; those who do not rightly know, in what manner a spherical vault may be cut so as to fit exactly almost any sort of Plan, and so as to overcome every imaginable structural and other difficulty, may there observe, the manner in which the sections of hemispherical domes are made to fit correctly the rectangular compartments of the Plan; and above all, the way in which, from the avenue coming obliquely next the Strand, the first dome of the series is cut obliquely so as to leave no raggedness, or be prevented from execution by any structural difficulty. But in the narrow compartment next St. Martin's Church, the ellipsis has been made use of in order to accommodate the Plan, whereas the use of circular sections would have produced more grace and correctness at less expense. See § 367. No. 8.

One temporary centre is sufficient for turning all the different domes forming such a series, and to construct all the domes in lasting incombustible materials for a price not one farthing dearer than the cost of combustible rotting ribs of woodwork.

330. But the pernicious system, has been long engrafted into building: we have now, no masons, no bricklayers, whose scientific knowledge is cultivated; no artificer, except the carpenter, now knows anything of drawing geometrical lines,—and he, from the decay of art, rarely knows anything which can carry him in a scientific manner through any structural difficulty, much less enough to ennoble his art.

Carpenters and masons are in general very tractable men, who may be taught any degree of skilfulness, though our modern bricklayers are mostly the rudest and least careful workmen who are to be found at present practising in any handicraft business; and while most other workmen take a pride in trying and rendering their work exact, the modern bricklayer seems to think his dignity offended by altering the position of his materials from the place where they may have been first hastily cast, and would rather abuse you than alter a joint or fill it with mortar; nay, if even the bricks of which he is forming the most important bearing-piers, break under the blow of his trowel, he leaves them where they break, alike unconcerned whether they support their burthen or sink beneath it.

331. But let us become once more Real Free-masons, and we shall have ribbed vaults, and domes, built of stone for the price of our present mean and perishable wooden skeleton-work; and the skill of the workman, his quickness, his handiness, and his ability, will with those imperishable domes and vaults, give us the cunning and adornment of the olden times, for even the price of the mean and disgraceful cuticle of lath and plaster with which our present mock architecture is invested.

332. Wooden rib-work and plastering, lie at the mercy of the slightest breakage or defect in the roof; a tile or a slate broken, the trampling of a person, the least crack in the lead-work, may lead to destruction before the damage is observed.

333. Of the improper use of wrought-iron notice has already been taken in Chapters XXVI. and XXVII., of the improper use of Bath-stone in Chapter XXIX., and of the quick decay of Mastic, and of the improper use of Parker's Cement, in Chapter XXXI.

334. The truth is, the practical study of architecture, has all over Europe been in a gradual state of decay ever since the reign of King Henry the Eighth.

The success of our forefathers, proves that they treated their subject philosophically; it proves that the most delicate refinement of theory and the most exact practical skill, went hand in hand, and were interchangeably the result of each other, so that it is impossible to separate their theory from their practice:—Their works, seem as it were from their birth, to have co-inherited this excellence; they appear to have come forth from the Womb of Art, perfect and freshening like the bud of the plant, in the pride of beauty more than human; The arches, beams, and other great component parts of them, had as much to do with their form and outward graces,—as the bones and muscles of the human frame have to do with *its* graces, actions, and smiles; like the flowers of the field, their works are wonderfully different,—the study of them, like the study of botany, is never-ending; they all bear the impress of design; they all seem as though they were from the type derived from the Divine Spirit of Wisdom, which erst gave the pattern for the Holy Tabernacle.

335. All the architectural works of the olden times, which exhibit such structural excellence, do all awaken the most delightful sensations, in the poet, the antiquary, the philosopher, the layman and the churchman, the civilian and the warrior, the prince and the peasant:—Structural excellence, and poetry, go hand in hand, alike with the works of the Egyptians, the Greeks, the Hindoos, the Romans, the Arabs, the Moors, and the early Christians. But now instead of so forming our architecture, we disdain structural excellence; the only endeavour, is to copy at second-hand, some ancient work, in bad and improper materials, and strike alone (and that even but very, very rarely) at pictorial effect; yet we wholly fail; the proof of this is, that the soul of the modern painter which delights in embodying in his charming works all kinds of ancient architecture, will not copy one particle of our modern architecture; nor will we ourselves copy from it: This proves incontestably that art and science in architecture have fallen; were it otherwise, our porcelain, our plate, our furniture, every thing around us, would bear the strong family impress of our architecture, as such things have in all times past and in all nations.

336. The author does not write this for the present age, for he expects to be cut short by it with all the usual false arguments of the present high prices of labour and materials, prices which are however comparatively cheaper than they were at any former period.

It cannot be, that modern Britain is unable to rival in the intrinsic goodness and beauty of her architectural works any nation of antiquity. Nay, shew but the probability (however fallacious) that one-hundredth part per cent. more profit may be obtained than by any of the ordinary channels of speculation, and a company of commercial jobbers in some narrow alley of London, will in a few hours raise capital enough to build of the finest and most lasting materials, works as great as the Pyramids and all the other grand works of antiquity.

CHAPTER XXXIX.

Of the Injury Resulting to Architecture from the Improper State in which Timber is Generally Used in London and its Surrounding Neighbourhood.

337. Added to the other defects of modern English building, particularly that of the metropolis and its immediate neighbourhood, is the improper state in which timber is used. This subject has been slightly noticed in § 327.

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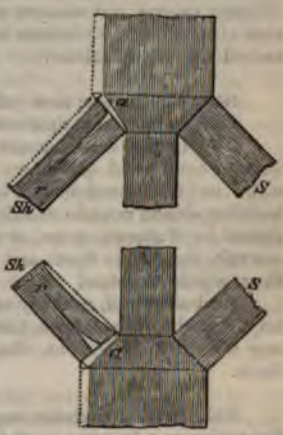
The major part of our best timber, is imported from the north of Europe, *and is immersed in docks*, and lies there floating till it is sold for immediate use; the consequence of this is, that the timber, (though even it may be previously properly seasoned) becomes swelled to much beyond its former and its ultimate bulk, is hastily framed together while the very water is running from it; and very soon after it is so converted, it shrinks to such a degree, that every tenon becomes loose, every joint strains falsely from the shrinkage, and every ceiling and quartered-partition cracks by the opening diminishing and distortion of the wood.

338. Some persons, fancy that to immerse timber in water seasons it; however this may be (and it may well be doubted) it does not render it fit for use, but the very reverse of it. Timber for ordinary purposes, should be shrunken to its smallest limits before it is worked up: the least possible change should occur in the timber after the work is framed and adapted; for all the oblique joints of it, by shrinkage become imperfect, each bearing-timber then hangs straining upon a single point instead of upon a flat direct abutment; thence many of the struts and other bearing-timbers, rend by the weight hanging merely upon their angles.

An act should be passed by the legislature forbidding the general immersion of timber in water by the merchants.

339. In very many cases, dry-rot is engendered in our hastily-constructed buildings, by the quantity of dock-water pent up in the timber, by its mortices and other joints, by the plastering, by the brickwork, and by many other causes. While our timber is at the saw-pit, the water streams from it; and though it may appear choice and close, when first selected and wrought, the sun and air in a very few days suffice to render it coarse, open, full of cracks, and wholly unfit for good work.

340. Our specifications are very strict in the requirement of the perfection and proper seasoning of timber; but these precautions are almost useless: the builder can hardly procure at any price, timber which is not in a dropsical condition; and twelve months, in general, suffice to diminish in bulk, and to split our carpentry, alike whether it be framed for the palace or the cottage, for the public or the individual.



S. S. A Principal and a Strut framed with close abutments into a king-post or suspender of new timber.

Sh. Sh. A Principal and a Strut originally framed with close abutments, but afterwards straining each upon one angle on account of the shrinkage of the timber rendering the abutments *a, a*, less inclined.

r. r. Rents frequently caused to the timbers by the irregular strain resulting from the shrinkage.

CHAPTER XL.

On the Carelessness of not Banishing from Public Buildings all Combustible Materials, and of the Disasters Emanating from this Vice.

341. It does not appear whose fault it is, yet hardly can it be deemed anything short of a crime against the nation, that the most truly valuable collection of riches in the world,—the statuary, the curiosities, the records, the books, the royal library, the immense wealth of the British Museum, the liberal gifts of the public, the munificence of kings, the liberal and princely gifts of high-souled true patriots,—nay, it is a foolish, a childish crime, that this wonderful, this admired, this unpurchasable store, of art, taste, wisdom, learning, of heavenly and of human mind, should be placed in a new building, where the consuming floor, the blazing roof-beam, the ignited wainscot, may destroy in a few hours, the relics of four thousands of years, or more, the statuary of Phidias, the invaluable manuscripts, the Magna Charta, and the innumerable other things, which neither industry, wealth, nor time, can replace. How many centuries did the timber-work of York Minster escape, and was yet at last consumed, and with its destruction entailed that of much of the precious sculptures in stone, which till lately enriched that sacred and august fabric?

342. Can no one now build an edifice which will neither rot nor burn?

Can no one build apartments vaulted with brick or stone?

The British Museum ought to be built without joists, girders, floorings, ceilings, or even bond, *of timber:* an incombustible roof may be difficult to construct well; but the case demands imperiously that it should be so constructed; the building should contain no skirtings, wainscottings, or door-linings, of wood; these should be of stucco, stone, or marble, or of some other incombustible material; scarcely should the doors and windows be of wood, or have any material about them which can burn.

And above all, as many of these fine stores of knowledge, industry, and history, will themselves burn, they ought to be so detached, in small portions, that any lamentable accident, shall only destroy a comparatively small portion of them.

343. *When a wretched conflagration has totally deprived us of a British Museum,* the nation in a ferment, with loud clamour, will order an incombustible building to be erected; but there can never again be SUCH a "BRITISH MUSEUM" as the nation now possesses, and which, with proper care, would form the nucleus of the richest and most surprising collection on earth.

344. On this subject, Alberti, with his accustomed wisdom, speaks thus:—

"I am entirely for having the Roofs of Temples arched, as well because it "gives them the greater Dignity, as because it makes them more durable. And, "indeed I know not how it happens that we shall hardly meet any one temple "whatsoever that has not fallen into the calamity of fire. We read that *Cambyses* "burnt all the Temples in *Ægypt* in general, and removed the Treasures and "Ornaments belonging to them to *Persepolis*. *Eusebius* relates, that the Oracle "of *Delphos* was burnt three Times by the *Thracians*, and another Time it took "Fire of itself, and was rebuilt by *Amasis*, as we are informed by *Herodotus*. We "read too that it was once burnt by *Phlegyas*, about the time that *Phœnice* in-"vented some Characters for the Use of the Citizens. It was also consumed by "Fire in the Reign of *Cyrus*, a few Years before the Death of *Servius Tullus*, the "King of *Rome;* and it is certain, that it was again burnt about the Time of the "Birth of those three great Luminaries of Learning, *Catullus*, *Sallust*, and *Varro*.

"The Temple of *Ephesus* was burnt by the *Amazons*, in the reign of *Sylvius* "*Posthumus, as it was* also about the Time that *Socrates* was condemned to drink "Poison at *Athens:* and the Temple of the *Argives* was destroyed by Fire the "same Year that *Plato* was born at *Athens*, at which time *Tarquin* reigned at *Rome*. "Why should I mention the sacred Porticos of *Jerusalem?* Or the Temple of "*Minerva* at *Miletus?* Or that of *Serapis* at *Alexandria?* Or at *Rome*, the "*Pantheon?* And the Temple of the Goddess *Vesta?* And that of *Apollo?* "In which last we are told the Sibyl's Verses were destroyed. We indeed find, "that scarce any temple escaped the same calamity. *Diodorus* writes, that there "was none besides that dedicated to *Venus*, in the city of *Eryx* in *Sicily*, that had "escaped to his Time unhurt by the Flames. *Cæsar* owned that ALEXANDRIA "ESCAPED BEING BURNT, WHEN HE HIMSELF TOOK IT, BECAUSE ITS ROOFS WERE "VAULTED. Nor are vaulted roofs destitute of their Ornaments. The Ancients "transferred all the same Ornaments to their Cupolas, as the Goldsmiths used about "the Pateras or Cups for the Sacrifices; and the same Sort of Work as was used "in the Quilts of their Beds, they imitated in their vaulted Roofs, whether plain or "camerated. Thus we see them divided into four, eight, or more pannels, or "crossed different Ways with equal Angles and with Circles, in the most beautiful "Manner that can be imagined. And here it may be proper to observe, that the "Ornaments of vaulted Roofs, which consist in the Forms of their Pannels or Exca-"vations, are in many Places exceeding handsome, and particularly at the *Rotonda* "at *Rome;* yet we have no where any Instruction left us in Writing how to make "them. My Method of doing it, which is very easy and cheap, is as follows: I "describe the Lineaments of the future Pannels or Excavations upon the Boards "of the Scaffolding itself, whether they are to be Quadrangular, Sexangular, or "Octangular. Then those parts which I intend to excavate in my Roof, I raise "to the stated Height with unbaked Bricks set in Clay instead of Mortar. Upon "this Kind of Mount thus raised on the Back of the Scaffolding, I build my vaulted "Roof of Brick and Mortar, taking great Care that the thinner Parts cohere "firmly with the Thicker and Stronger. When the Vault is compleated and "settled, and the Scaffolding is taken away from under it, I clear the solid Build-"ing from those Mounts of Clay which I had raised at first; and thus the Shapes "of my Excavations or Pannels are formed according to my original Design."—Book vii. Chap. xi.—*Leoni's* Translation.

345. Is it not enough, that most of our churches were burnt down several times within a very short period before our prudent ancestors adopted stone for the structure of the principal parts of them, and the use of which material has since saved most of them for centuries? Is it not enough, that in and near our own times, London and other cities have suffered so severely from conflagration,—that the Cotton manuscripts, now in the British Museum, should have once been partially destroyed,—that the Custom House of London was consumed,—that the British Parliament Houses, suffered the same fate,—that the roof of the precious Abbey of Westminster, has been on fire,—that the Cathedrals of Rouen and Chartres, lately met the same fate,—that the like misfortune, two years since, occurred to the Marquis of Salisbury's celebrated house at Hatfield, in Hertfordshire,—that the new Church at Pimlico, a few months since shared no better? and that the Royal Exchange, London, has just been destroyed? These form but an exceedingly small portion, of the disasters, which have within a short period, occurred to buildings of consideration; but the accidents by fire, which have happened within memory to private buildings, no catalogue could enumerate; it is true, that in London, the excellent provisions of the Building-act, for the partial prevention of fire, have many times saved the metropolis from a fate similar to that of the year 1666, and do in most cases of burning, confine the damage to one house; yet such is the strange perverseness of many of those who build, or such are the perverse circumstances under which they build, that they seem to consider this benevolent act, as one which it is their duty to

evade,—and the district-surveyors appointed to see its provisions fulfilled, as men whom it is their duty to out-wit, or whose integrity is to be tampered with for a guinea or two*.

346. Now, on the subject of rendering buildings fire-proof, the reader is referred, for ordinary buildings, to the *Transactions of the Institution of Civil Engineers of London*, in the xviiith Article of the 1st Volume of which, is to be found a most interesting "*Description of the Method of Roofing, in use in Southern Concan, in the East Indies.*" *By Lieut. Francis Outram.* For buildings for the purposes of store-houses, the reader is referred to the new ware-houses erected of brickwork stone and iron, at Sheerness, Kent, and other places; and to the vaulted apartment under St. Stephen's Chapel, Westminster, which withstood, uninjured, the great fire which consumed the Houses of Parliament. And for buildings of a sacred character, the reader is referred to the stone roof of the Church of Batalha, in Portugal (see § 189); Rosslyn Chapel in Scotland; to the Cathedral of Milan, relative to which see *Archaeologia*, Vol. 16. p. 303, where the late ingenious accomplished and Rev. Mr. Kerrich states, "It is extremely singular that there is no covering of tiles, or lead, or copper, or any roof of timber, to this church: it is merely vaulted over, and upon the vaulting are laid large slabs, or planes of marble, to carry off the rain and moisture."

347. And again, the Reader is referred to the instances of the stone-roofed chapels of Ireland, some accounts of which will be found in the "*Antiquities of Ireland*," by Edward Ledwich, LL.B., A.D. 1790, and from which the following extracts are taken:—

"The Church of St. Doulach, situated about four miles to the East of Dublin, on the road to Malahide, is a curious structure. It is forty-eight feet long, by eighteen wide. There is a double stone roof, the external which covers the building, and that which divides the lower from the upper story." "You enter the chapel. This is twenty-two feet by twelve, and lighted by three windows, one at the East, and two at the South; the arches pointed and decorations Gothic, these with the tower are later additions. The roof is of stone and carried up like a wedge. The stones which cover it are not large, but so well bedded in mortar, that after many centuries this roof transmits neither light nor water."—p. 144.

"There is a very ancient crypt in an isle in the Shannon, not far from Killaloe, but that of the greatest magnitude and best architecture is Cormac's Chapel at Cashel. This stands on an high insulated rocky hill. The inside length is forty-seven feet eight inches; the breadth eighteen: the height of the roof from the ground, on the outside, is fifty-two feet, and the slant of the roof twenty-four. It has a chancel and nave. On square pillars, adorned with a lozenge net work, rest round columns as on their pedestals, from which the springers of the arch arise. These columns are short and thick, and have bases, tores, capitals and entablatures, rudely executed: the portal is semicircular, with nail-headed and chevron mouldings, and the windows are also half circles."—p. 146. "The stone-roofed chapels before described, and denominated from Cormac, I think, must have been constructed posterior to the age of this prelate." "The dimensions of this chapel are thus stated:—

	Ft.	In.
"Length of the nave	30	0
"Breadth	18	0
"Length of the choir	13	8
"Breadth	11	6
"Breadth of the grand arch leading to the choir	9	0

* Occasionally a case happens, in which by a verbal or a fanciful construction of the *Act*, the intentions of the legislature are defeated: of this, more hereafter.

	Ft.	In.
" Width of the north door	2	7
" Of the south door	3	4
" Of the west door	4	6
" Mean thickness of the walls	4	1
" Length of the square tower	10	0
" Breadth	6	8
" Height	68	0
" Height of the stone roof from the ground	52	0
" Slant of the roof	24	0
" Diameter of the columns of the grand arch	0	6
" Height	8	0
" Height of the entire arch	12	6
" Breadth of the archivolt	3	6
" Length of the chapel inside	47	8
" Length outside	53	0

" This is certainly one of the most curious fabrics in these kingdoms. It is "a regular church, divided into nave and choir, the latter narrowing in breadth, "and separated from the former by a wide arch. Under the altar, tradition "places the bones of St. Cormac. There is a striking resemblance between this "Chapel and the Church of St. Peter at Oxford, with Grymbald's crypt beneath "it."—p. 150.

348. Moreover, the reader is referred to the instances of the incombustible brick dome over the Pantheon at Rome, which is perhaps the cheapest as well as the most durable and unconsumable roof which could have been erected over so great a building: other instances are the reputed tomb of Theodoric, at Ravenna; the ancient curious brick dome of the temple of Jupiter in the Palace of Diocletian, at Spalatro, in Dalmatia; and above all the excellent instance of the reputed Temple of Vesta at Nismes, in Languedoc, the vaulting and external covering of which are of the lightest yet most durable description, and may be imitated in common brickwork and slate; this specimen may be applied successfully to the very largest class of modern churches, and while it affords the greatest possible internal sectional space, it possesses the further advantage of the inclination of its external covering being adaptable to the rake of a pediment*:—and among modern instances may be mentioned the early instance of the celebrated cupola of the Church of Santa Maria del Fiore, at Florence, the work of Filipo Brunelleschi; that of the Vatican designed by Buonarotti, though very defective in structure; and that of the recently-erected Church of Saint Geneviève at Paris: to these may be added many oriental domes; and in general, the Gothic Cathedrals and great Churches, in England and other countries, are indestructible by fire, except their roof-timbers; and the same may be said of the Cathedral of Saint Paul, London, which, except the carpentry over its various domes, is entirely fire-proof; and among the other structural excellencies of this sumptuous building, its several porticos possess the exceedingly rare merit, of having their soffits entirely formed of beautiful stone, so as in this particular, to throw into the shade all the porticos of Greece, the roofs of which were formed of the most expensive materials, yet were weak

* The following is Palladio's description of the example at Nismes:—
" Le colonne che sono intorno la Cella sostentano alcuni archi fatti di pietre quadrate, e da vno di "questi archi all' altro sono poste le pietre, che fanno la volta maggiore del Tempio. Tutto questo "edificio è fatto di pietre quadrate, & è coperto di laste di pietra poste in modo che vna andaua sopra "l'altra, onde la piogga non poteua penetrare."—lib. iv. cap. 29.
In copying this example, it will be well to relieve the crown of the vaulting from burthen, by supporting the apex of the roof by cross walls set at intervals upon the vaulting, with circular apertures or *bull's eyes* in them, instead of with solid work as at Nismes; or the same object may be better obtained by filling up the apex-spandril between the vaulting and the external covering, with hollow pipes of burnt clay, something like chimney-pots or drain-pipes.

and perishable, the marble coverings of them, from want of science, being frequently upborne merely by wood-work, which if it escaped conflagration, soon decayed by the moisture which it imbibed.

349. And here, it is but justice to the late Sir John Soane, to praise the manner in which he constructed nearly all the apartments of the Bank of England, entirely fireproof, and without any carpentry whatever: in his arches and domes, he made use largely of hollow pots or cones, of coarse earthenware, of the description shown in the adjoining wood-engraving: these, while possessing strength sufficient not to crush,—by their lightness, relieve the walls in a great measure, both from the lateral thrust, and the perpendicular pressure, which result from the use of heavy solid materials: and indeed, it might be possible to form arches and vaults of equilibrium, of these pots, by leaving empty those of them placed at the summit of the work, and gradually filling them with cement or mortar of different densities, increasing towards the springing of the arch, and thus to prevent both crushing and drift to the haunches and lower part of the work.

a. Ichnography (inverted) of the pots; 4½ inches square at the head, and 4½ inches diameter at the soffit.
b. Section of the pots:—length 7½ inches; thickness, ½ inch average. The hole through the soffit of each pot forms a key for the plastering.
c. Perspective view of the pots, shewing the rough spiral marks scratched upon their exteriors to hold the mortar.
Weight of each pot, only 3 lb. 4 oz.
Weight of a mass of solid brick, of the same external dimensions, 5 lbs. 4 oz.

350. But it is to be lamented, that so soon after the retirement of Sir John Soane, and even before his death, a disposition should have evinced itself, to depart from the wise banishment of combustible materials from this national establishment, the occurrence of a fire within which, might lead to the most serious confusion, by the loss of documents (to say nothing of the destruction of wealth and the purloining of it during the occurrence of a fire) and which at one blow might render uncertain the tenure of the fortunes of half the families in the kingdom. It is hoped that these observations, will suffice to check within the Bank of England, the inroad of this destructive innovation; for it is absurd, that the records of the wealth of the families of a nation, should lie at the mercy of a few sticks of wood:—and it is also to be desired, that any new grants of privileges or funds to the Bank of England and to the British Museum, will require absolutely that *every part* of the buildings of those important establishments shall be *wholly and in fact* indestructible by fire.

351. The following instance of the use of hollow pots in the construction of vaults, cupolas and other parts of edifices, by the ancient Romans, are noticed by d'Agincourt in the 135th page of the first volume of his "*Histoire de l'Art, par les monumens, depuis sa décadence au* 4^e^ *siècle jusqu'à son Renouvellement au* 16^e^."

"L'emploi des vases de terre, dans la construction des murs, et sur-tout des voûtes, offre une singularité qui mérite d'attirer notre attention.

"On ne s'en servait point comme des vases d'airain dont parle Vitruve, lib. v. cap. 5. dans l'intention de donner à la voix plus d'éclat et au son des effets plus prolongés.

"Les vases de terre cuite, dont Vitruve parle aussi, avaient uniquement pour objet d'alléger le poids des constructions dans lesquelles on les employait, et de prolonger la durée des monumens, en diminuant leur dépense. C'est ce qu'on voit au cirque de Caracalla, fig. 50.

"Le genre de service que la poterie pouvait rendre, comme objet de maçonnerie, devait la faire principalement employer dans la construction des niches

"et des voûtes. Nous en avons vu la preuve, à Rome et à Ravenne, dans des "monumens rapportés sur les planches xxii et xxiii. La figure 51, nous en offre ici "un exemple : c'est l'escalier par lequel on descend de l'église de St. Sebastien, "hors des murs de Rome, dans l'oratoire souterrain dit de St. Damase. "Ce monument est du 4e siècle.

"On retrouve encore la même construction dans deux fabriques des environs "de Rome, dont je ne puis indiquer la date, mais qui sont certainement très "anciennes. La première, fig. 49, est située à peu de distance de la porte "Majeure, sur l'antique voie *Prænestina :* elle est entièrement en ruines. "Des vases de terre, de la forme de celui que j'ai figuré dans son entier, se "voient encore de distance en distance dans le massif des murs, et en les trouve "disposés sur deux rangs sur la cime d'une espèce de calotte qui recouvrait "l'édifice. La seconde fabrique est située à trois milles à-peu-près de la même "porte, sur la voie *Labicana*, dans un lieu qui s'appelait autrefois *Inter duas* "*lauros*. Cette ruine, de forme circulaire, offre une telle quantité de vases de terre "cuite, qu'on l'appelle encore aujourd'hui *Torre pignattara*, du mot Italien *pig-* "*natta*, qui signifie un vase de terre. Ce surnom populaire est loin de rappeler "l'auguste et religieuse origine de la fabrique qu'il désigne : celle-ci faisait partie "de l'église dans laquelle Constantin avait placé la magnifique urne qui contenait "le corps de sa mère Hélène.

"On a trouvé, en Sicile, une porte antique, fig. 35 et 36, dont les jambages "sont en pierres de taille, et dont le ceintre est formé par trois rangs de vases "ou de tubes en terre cuite enfilés les uns dans les autres. Les vases de terre "trouvés à Metz, dans un pavé de mosaïque, nous offrent une pratique beaucoup "plus extraordinaire, que le comte de Caylus a cherché à expliquer dans le tome "v, page 327, et Pl. cxviii, de son Recueil d'Antiquités."

352. In conclusion, if other instances were wanting, to show in what manner even regal habitations may be rendered fire-proof, may be instanced the Portuguese King's Palace of *Mafra*, a description of which may be seen in the work of Father John do Prado, published at Lisbon, A.D. 1751*; and of which also may be found in the 289th page of Murphy's *Travels in Portugal*, A.D. 1789-90, the following notices :—"The entire of this vast pile is vaulted and covered over with "flags, forming a platform, whereby we may walk over the summit of the edifice;" but even this building it appears suffered from the effects of lightning, and the want of proper conductors, which have since been erected in some parts of the building; for Murphy goes on to state, that "Here I observed several large "blocks of stones that were shivered by lightning. Conductors are erected in "the different parts wherein the injuries happened, but no where else."

CHAPTER XLI.

On the Inferiority which is Often to be Found in Modern English Brickwork.

353. It is a remarkable fact, that in proportion as the manufacture and burning of Bricks have improved, and while the use of Stone-lime has become more general, the Workmanship of much of our modern English Brickwork, has debased in quality more than the materials of the work have improved. The author is obliged to confess, that although he has taken very great pains, to procure complete soundness in the execution of Brickwork, he has almost wholly failed : his idea of soundness, is nothing more than that the work should be composed of good materials correctly bonded in every part, should be thoroughly cemented together, and that as few broken bricks as possible should be used in the work.

* "Monumento Sacro da Fabrica, e Segraçaõ da Santa Basilica do Real Convento de Mafra. João do Prado. Lisboa, 1751." A copy of this work is in the Royal Library of the British Museum.

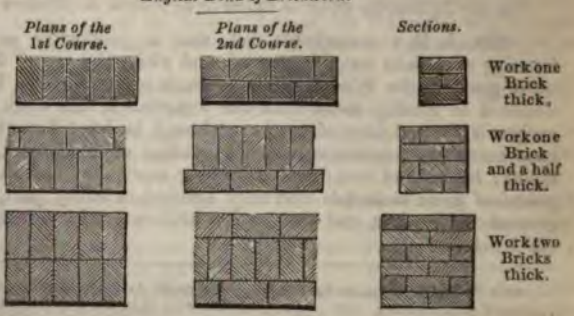
354. An idea is prevalent, that great care and exactness in the choice of the materials of Brickwork, and in the Workmanship of it, are too burthensomely expensive to be borne in ordinary buildings; no idea could be more erroneous, for bad materials will not support much more than their own weight; and though bad Brickwork may even cost only £10. per rod, a much larger bulk of it is required for supporting the same weight, and for keeping out the weather equally well, than for the same purpose would be required of Brickwork of a better quality, while the carriage and the excise duty are as costly, and the mortar and workmanship of it are as expensive and sometimes more so.

355. It will be found that for the performance of a certain quantity of duty, *Malm paving-bricks* set in the best stone-lime mortar, will (besides their superior duration) be cheaper than the worst descriptions of *Place-bricks*. It is useless to plead, that of itself, circumstances apart, such a wall is too thick or too thin; for sufficiency of substance depends entirely upon the purpose for which work is required. If he who built Salisbury spire, found out the art of so disposing the materials of it, as to make a thickness of 7 inches of stone last 500 years and still to remain, it is in vain to say that a wall 9 inches thick will not serve for such or such a purpose: the masonry of Gothic edifices is but rarely in its particles so sound as excellent Brickwork; and yet frequently, though you cannot get a builder to double the strength of his walls by careful workmanship, he very often advises you to double the thickness of them in situations where weight and bulk are positive evils.

356. When you deduct from Brickwork in ordinary buildings, the loss of strength occasioned by badness of material, by disconnection of the bond, by small pieces being inserted where whole Bricks should have been used, and by the weakness which is the result of the work not being duly cemented, you will find that the useful part of common work (if indeed it possess any such) executed at £10. per rod, really costs £50. or more per rod: and then when it is considered, in a vast number of our erections, that from one pier not being set over another, a large portion of such piers instead of supporting the superincumbent weight, act as ruinous burthens upon the remaining parts of the pier, it will be found that the quantity of effective Brickwork is often so reduced as to cost more than £100. per rod: and indeed it is almost a mistake to say that any of it is effective while in jeopardy from defective nature and mal-construction.—In this view of the subject, Brickwork is somewhat different from Timber-work; for the nice calculator of interest is frequently satisfied, provided he can save by the use of low-priced and bad timber present outlay more than enough to counterbalance the expense of subsequent repairs, and perhaps he may on some special occasions be right, though, nationally considered, the use of bad timber is a disgrace.

357. It is universally admitted, that *English-bond* is the mode in which Brickwork can be put together with the greatest strength,—for in no part of such work, when properly done, does joint come over joint, and it does not require small pieces of brick to fill up the work; moreover it

English-Bond of Brickwork.

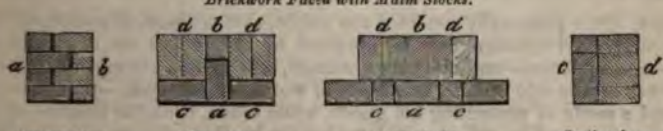

Plans of the 1st Course.
Plans of the 2nd Course.
Sections.
Work one Brick thick.
Work one Brick and a half thick.
Work two Bricks thick.

may and ought to be done entirely with whole bricks, except the "*closers*" near its angles, requisite in order to adjust properly the bond. Whereas *Flemish-bond* requires of necessity through its whole structure, a multitude of small pieces, and possesses the additional inconvenience of having throughout its structure, a series of coffers (filled with unbonded work) which extend perpendicularly from the base to the summit of the work.

Flemish-Bond of Brickwork.

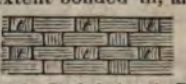
358. It is customary to consider *Flemish-bond* as indispensable for the external facing of even the commonest descriptions of buildings; hence there is license given for the most defective workmanship; for as in general, bricklayers use for all work out of sight the *English-bond*, they make the insides of external walls of *English-bond* and the outsides of them of *Flemish-bond*, and thus much irregularity and breach in the bonding of the work ensue. In order to avoid this evil, the author, for some considerable time past, has had all his external walls, except those of Principal Fronts, executed entirely within and without in *English-bond*; and he would have adopted the same mode of structure even in Principal Fronts, had he not been restrained by the fear of increasing the proportion in the quantity of *Facing-bricks* which are in general much softer and inferior in goodness to the description of grey-stock bricks which he in general uses: and this imperfection of the ordinary *Facing-bricks* has almost induced him to lay aside altogether the ordinary *Facing-bricks*, and to make his walls only of moderate thickness, but within and without entirely of the very best *Malm paving-bricks*, a description of material which he believes to be the most excellent for walls; and this would remove altogether the imperfection of softness, and the want of tie, in the ordinary facings of Brickwork; for by the ordinary mode, of carrying into the body of the work the "*headers*" of but every alternate course, only one sixth part of the superficial extent of the facings can be tied into the work; and when it is considered how many of the "*headers*" break off while the workman is laying them,

Brickwork Faced with Malm Stocks.



Section from a to b. *Plan of the 1st Course.* *Plan of the 2nd Course.* *Section from c to d.*

how many he omits from carelessness or fraud, and how many of them are short when used,—it will be found that only about $\frac{1}{8}$th part of the superficial extent of the work is bonded,—and in common bad ordinary work, the tie may be reduced to $\frac{1}{10}$th;—and the author has seen work in which it was reduced to less than $\frac{1}{20}$th of the superficial extent, and acted rather as a burthen than a support to the Brickwork. But if a wall be built wholly of *Malm paving-bricks*, the facing if the work be in *Flemish-bond* will have $\frac{1}{4}$ of its superficial extent bonded in, and if of *English-bond* $\frac{1}{2}$ of its superficial extent will be bonded.



Malm Stock facings in Flemish-bond.

t. The only Bricks which tie the facing with the body of the wall.

359. By the ordinary mode of bonding in only the "*headers*" of each alternate course, two thirds of the extent of facing throughout the work, are separated from the back-work by a series of perpendicular joints extending from the base to the summit of the work. See section from *c* to *d*.

Facings of English-bond.

360. The author believes that if the favour in which *Flemish-bond* facings are held be not altogether a preju-

dice, the superior soundness of facings of *English-bond*, ought to prevent the use of *Flemish-bond* in most cases where it is now adopted.

361. It is of the greatest importance to reduce Brickwork to the smallest possible dimensions ; for besides the saving of the carriage and duty of the materials, the foundation is thereby disburthened of a crushing heap. In many parts of structures, their grace and convenience depend solely upon the ability to reduce the bulk of their substantial component parts , and moreover, every proprietor has a natural inherent feeling against the occupation of the site of his habitation, by an useless bulk of materials : and the disparity in favour of the quantity of permanent strength to be produced out of a given sum of money, by the use of good materials and good workmanship, should for ever, with the wise and truly economical, banish inferiority. The wonder with which mankind in general view a small quantity of materials reared by delicate art, should be sufficient inducement for the architectural practitioner to take some pains in this respect.

362. The author has sometimes under peculiar circumstances, run up to a considerable height, walls in their principal parts no thicker than 9 inches, and has been cautioned against this ; but he has found although he could not get the Brickwork executed to his satisfaction, these walls, from even the moderate care which has been used in their formation, have remained without flaw,—while walls much thicker, raised by those who gave him their advice, have in a few months cracked and fallen to ruin, because they were worse-constructed, and were reared contrary to all static principle.

363. Of how much importance it is to reduce the bulk of the component materials of an edifice to the smallest bulk which safety will allow, is the circumstance of the fondness with which so many persons view the adoption of small coarse and proportionless pillars of iron, in preference to the most beautiful piers and columns of either *Grecian* or even *Pointed Architecture*.

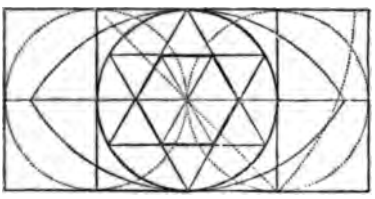
364. Only practically convince the public, that economical soundness, internal capacity, and duration, may be obtained by the proper use of proper materials,—and the coarse and slovenly workman, will in vain attempt to defraud his employer by the sale of large quantities of worthless materials,—the brick-maker will find a mode of protecting his goods, while crude, from the injuries of inclement weather, and he will so well burn his bricks, that no more soft ones will be in the market than can be used for mere purposes of bulk and weight, or for the spandrils of vaults, or else merely for the repairs of old and inferior buildings, the great duration of which is of little consequence.

365. The author is the more earnest in these remarks, since he finds it difficult to disabuse one class of employers, from the ill advice which they receive from inferior tradesmen, who unable to perform any thing well, find more pecuniary profit result from the sale of a large quantity of bad materials and bad workmanship, than from the performance of a moderate quantity of excellent work.

Perhaps no other description of work executed at the present day in England, calls for such asperity of condemnation as much of our London Brickwork: where it is to be exposed to view, it is too often bad enough ; but where it is to be concealed, as is so often the case, by vicious plaster finery, *one half the expense of which might have made it work indeed*, no pen can describe adequately its abominations, its pseudo-arches, its want of bond, its shattered condition, its internal uncemented state, and its general badness of materials.

CHAPTER XLII.

Of the Decline of Geometrical Science in the Architecture of England.



366. " On en trouue d'autres, quoy que rarement à la verité, qui ayant bien "establi leur première estude sur les principes de la Geometrie auant que de "trauailler, arriuent après sans peine & asseurément à la connoissance de la "perfection de l'art, ce n'est qu'à ceux-lá que ie m'addresse."

" Parallèle," by Roland Freart, Sieur de Chambray, p. 2.

367. During the middle ages, geometrical science was applied to architecture in the loveliest manner: the general plan, the columns, the arches, the doors, the windows, the galleries, the vaultings, the flying-buttresses, every panel, every compartment, the most minute ornament, exhibited an intimate acquaintance, with that profound and masterly science, without which, building becomes vicious, cumbrous, expensive, mean, fragile, absurd, and disgusting*: a single superficial foot of Moresco paving, contains more delicate geometry, than is to be found in many a modern English building of high assumption, which covers several acres of ground; many of the porcelain wall-linings of the Moors, are covered over with figures of such geometrical intricacy, that none but those possessed of a very considerable degree of geometrical skill could have designed them: the celebrated Tower of the Giralda at Seville, the architecture of which is ascribed to *El Gober*, the reputed importer to Europe of *algebra*, is covered all over with geometrical forms. After the decline of Gothic architecture, a foolish notion went abroad in the world, that cumbrousness and extravagance of material, were the characteristics of Gothic architecture; even that great and talented man John Evelyn, who possessed a very superior knowledge of architecture, entertained the then current opinion: but of late, mankind have become strangely undeceived upon this point; and the plans and sections of ancient and modern buildings, brought together in parallel, now fill the mind with astonishment, that so comparatively small a quantity of materials, and those frequently of mean quality, could have been piled up, to exist with little failure or decay such a long course of time: it is not that Gothic buildings are always perfect in construction, but in general they are nearly so; in fact so light are some of them, that they need more substance, as well as harder materials, to resist the mere operation of time upon their surfaces. The Gothic architects always built with the greatest economy: when square stone was easily procurable, they formed their walls very thin, but where from the length of the carriage of it, it became costly, they used for their

* To such an extent was the love of geometrical forms carried by the mid-eval architects and sculptors, that not only were crowns and mitres enriched with ornaments of geometrical figure, but even sceptres, crosiers, sword-belts, buckles, sword-handles, mail-clasps, scabbards, finger-rings, brooches, sleeves, fringes, borders, cushions, biers, stools and tables, were so embellished. Some examples of these applications of geometrical forms are to be seen in the late unfortunate Charles Alfred Stothard's exquisite work "*Monumental Effigies of Great Britain*," with "*Introduction and Descriptions*," by A. J. Kempe, London, A.D. 1813—32.

walls the most ordinary rubble-stone of the country, and they then gave to their walls thickness sufficient to prevent them from rending and rolling apart from the fluent nature of their materials. Saint Paul's Cathedral, the most scientific and successful work which was ever erected, contains in addition to the superb nature of its masonry, a proportionate bulk of materials, enormously greater than the Gothic cathedrals, alike in its piers, its foundation, its arches, its walls, and its vaultings: probably Wren could have poised up his work, using as little of material as the Gothic architects; but he aspired to something more: blessed by circumstances, with an unity of plan, and superior materials, he aimed at length of duration; and the bulk of his work, will probably remain, when every particle of the present Gothic cathedrals has disappeared.

368. The works of Wren, were a splendid revival of geometrical science; to a foreigner it must indeed seem strange, that except Saint Paul's Cathedral, his works are very little known to even most resident London architects. De Quincy, in his "Histoire de la Vie et des Ouvrages des plus Célèbres Architectes," vol. ii. page 251, thus expresses himself: "*On peut s'étonner "qu'il n'ait point été fait de recueil gravé des édifices que cet architecte, dans le "cours d'une longue vie, paraît avoir construits en divers lieux de l'Angleterre. On "en est réduit à de simples mentions de son biographe, mentions insuffisantes pour faire "juger de la valeur d'ouvrages qui, s'ils se sont conservés, auront dû éprouver plus d'un "changement.*"

369. Although most of his other works, are in constructive excellence, very inferior to the architectural master-piece of modern times; although it is evident, that in many instances, he had to contend with contracted sites, and with the comparative poverty which was brought upon the city by nearly all its public and private buildings being destroyed in one direful conflagration; and although it is evident, that the splendour of his professional career, which was greater than that of any other professional architect ancient or modern, afforded him such industrious occupation, that he could hardly give complete attention to the execution of his minor works,—still in the greater part of them, we discover the traces of a master-mind; we discover the masterly triumphs of geometrical science, in its kindly and shapely beauty, rising over irregularity of plan, obscurity of situation, meanness of materials, and civic obstinacy: though considerably alike in the particular ornaments in which Wren delighted, but which he hardly drew from himself, still in that part which was his particular study, viz. the geometrical design, they are all wonderfully different; and even some of the very meanest of them, are perfect geometrical triumphs over difficulties.

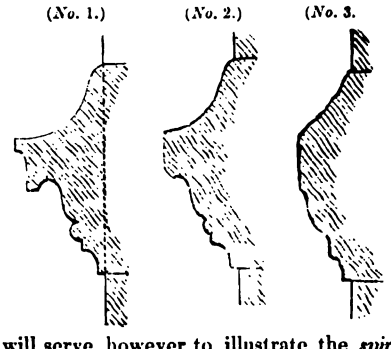
370. A large portion of Wren's smaller churches, buried amid the smoke and mud of a contracted commercial neighbourhood, inclose an irregular site, every inch of which circumstances have jealously compelled to be appropriated, —yet such is the ability displayed by the great master, that an internal uniformity prevails; it appears rich, lofty, and noble, while the rags of the plan, kept in the back-ground, are not perceived till you begin to measure the structure with the rule or line.

371. With Wren, alas, nearly expired the taste for all geometrical science in English buildings: the buildings of Wren, and those of the Gothic architects, carry the eye and with it the mind, up to heaven; our modern buildings, covered with mere white-washed carpets, appear ready to prostrate the mind and body into the earth.

372. Living in an age of philosophers and good men, with a mind of the richest culture, possessed of a mathematical knowledge which few men ever

attain, a public professor of astronomy, of a humane benevolent and mild disposition, too wise to be a sceptic, too learned to be a pedant, too busy to be a trifler, Wren came at once a ready-made architect, to supply the emergent wants of a great nation: he found constructive excellence, and the finish of buildings, in a state of expiration; he raised them at once, by wisdom, and the patronage of good artificers, to an excellence which in England has in very few instances since been equalled: the discriminating wisdom, with which he chose his stone and most of his other materials, puts to shame alike most of the Gothic buildings, and those of our own times. The greater part of his masonry, after nearly 150 years, and in some cases more than that time, is still more square fresh and perfect, than that of many of our modern buildings, which have been erected only ten or twenty years; and the growth of every year adds around them but a foil of grimy and crumbling stone and plaster, that more and more exaggerates the earthly triumph of this great and good man.

373. It is true that in some of his minor works, the ill-mannered hand of the foolish parish mason, in order to erase a few time-specks, instead of filling up such trifling defects, has coarsely chiselled away the profiles, pared down to meagre ugliness the bold and exquisite carvings, and has shamefully furrowed over the once fair surfaces of the walls with slovenly tooling; and in some instances, besides the paring away of the projections, the depths for shadow are filled up with clay-coloured plaster. The following profiles will shew the progress by which our finest and most valuable buildings are hastened to destruction; the example is taken from the impost mouldings immediately beneath the composite pilasters of the campanile of St. Vedast's Church, Foster Lane, London; this work has been dealt leniently with,—the impost mouldings were originally in the form *No.* 1.; time and weather had worn and partially broken their crown member: the mason would neither repair them nor leave them as they were for the information of those who might be engaged in a future restoration of them, but they were tastelessly reduced to the profile *No.* 2; probably at the next pretended repair of the steeple, they will be ground away to something like the formless profile *No.* 3.: it is thus that the chisel and hammer break down the carved work of those materials which but a short time before were brought to an excellent work; it is thus that the snares of death compass round about our best buildings. The repairs in the body of this church, the least excellent part of it certainly, will serve however to illustrate the *spirit* of modern ecclesiastical repairs: its wainscot altar-piece is repaired with painted mastic, and its finely-carved wainscot-pews are patched with painted deal!

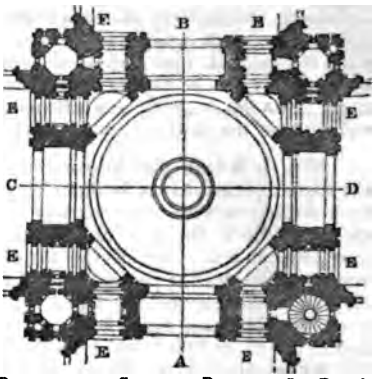


The injuries which are thus done to our public works, will hereafter leave apparent reason for the condemnations which great critics and small practitioners occasionally heap upon our finest old buildings, erected when generosity and science went arm in arm.

374. But while it is true, that the changeling spirit of those who admire alterations, alike whether good or bad, consistent or otherwise, has in many instances destroyed their noble carved-work and other excellences, and has not even blushed to wrench away the very columns from some of the best of them, it is to be trusted, that the day is nigh at hand, when their spoliation will cease, and when the citizens, alive to their value, will not only interdict all further

damage, but will have their present injuries as far as possible made good. Among those of his works which have suffered most violence, are the exteriors, of the churches of Saint Lawrence Jewry and Saint Clement Danes, and the interior of Saint Magnus. The barbarous and unfeeling project of *improving the city by destroying some of its best churches*, was fortunately prevented from being carried into effect, by the unbending taste and religion of the present worthy bishop.

375. The geometrical management of the Dome of Saint Paul's Cathedral, in beauty and science outstrips all other works both ancient and modern : in addition to the masterly manner in which the inner dome, the cone, the lantern, and the external covering of the cupola are contrived, and which are worthy of the most attentive study by the architect, the engineer, the geometrician, and the man of general science,—the grand scientific and artistic master-stroke of this fine edifice is the unrivalled manner in which the central Dome and the twelve internal avenues of thischurch unite without intercepting each other : this is the most successful triumph which geometry has ever achieved in architecture : the science of the Gothic architects was exceedingly great, but nothing so great in art as this, is contained in their works, though some may admire the particular taste of them more than that of St. Paul's Cathedral*.



PLAN OF THE CENTRAL PART OF ST. PAUL'S CATHEDRAL, LONDON.

A. The Nave of the Cathedral.
B. The Ante-choir.
C. The Northern Transept.
D. The Southern Transept.
E. E. E. E. E. E. E. E. The aisles of the Cathedral, all meeting, and possessing clear vistas every way through the dome of the Cathedral.

* 376. Since the above was in the press has appeared "*A Treatise on Projection*," by Peter Nicholson, in the 17th plate of which is also given the development of this piece of geometry.

Also, since the above was written, in one of the cheap publications of the day, the following remarks have appeared in a Description of St. Paul's Cathedral :—"There is great confusion in the parts "of the design throughout, and the arrangement of the junction of the aisles with the central area, "must ever be regretted, as giving an appearance of weakness to a part of the construction where the "greatest strength is required ; we must, however, remember the state in which architecture was "when Wren arose." Benevolent consideration! We must, indeed, remember its then state, and with a sigh mourn its present fall, the defunct condition of its science. If to have one design carried throughout the fabric without giving into any petty whims or petty deviations,—if to have its domes fitted in the most exact manner, by the most profound skill and fore-knowledge to the various parts of its complete magnificent and unrivalled Plan, so as in this particular, and in soundness and science, to outstrip all other churches,—if to have its soffits elaborated in solid stone by the powers of a superior geometrical knowledge,—if to have its decorations carried throughout the fabric, with a delicacy and a beauty of execution, which will enable it to take its station in that respect, without fear of being surpassed, among all the buildings of England, France, Germany, Spain, and Italy erected during the last four hundred years,—if these form confusion, such confusion is possessed by St. Paul's Cathedral in a more than ordinary degree :—but to the eye of him who alike loves science, architecture, his country and its religion, this confusion disappears ;—the unaffected English heart expands at the view ; —this only Cathedral designed and finished by one man, under one bishop, and wrought upon by one master mason, and all in one style, of the most durable and brilliant free-stone in the world,—to him the faults of this unique sacred edifice disappear ; he beholds it as the gem of Protestant Churches ; and he feels it an honour to his nation and its pure religion, that this, of all the cathedrals in the world, by an especial divine favour, was permitted to be the only one, which like the vesture of Christ, was ever wrought in one texture throughout.

It is rather dangerous ground, for a very young man to enter upon, and to be eager, to find fault with that which has ever been esteemed by those accounted the best judges in taste and science, the very touch-stone of Wren's skill and feeling, as an architect. The author will best answer this accusation, by cannonading it with the sentiments of two men both considered *rather* scientific : on the subject of the celebrated unrivalled vista through the aisles across the Dome of St. Paul's, Mr. Samuel Ware, in his "*Observations on Faults*," first published in the xviith vol. of the Archæologia,

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377. It is doubtlessly probable, that Wren caught the beautiful and magical idea of the cross vistas of the aisles of his church, from the central part of Ely Cathedral, of which his uncle was Bishop; but then the celebrated octagon of Ely Cathedral, however beautiful, could teach him nothing of the mode wherein the spandrel-spaces in which the eight side aisles at St. Paul's meet in pairs, are vaulted over with sections of hemispherical domes. And indeed if examples be sought for, the germ of the plan may be found in that of the ancient temple of Venus, at Baia; but we have no knowledge of Wren's acquaintance with this.

PLAN OF THE TEMPLE OF VENUS AT BAIA.

PLAN OF THE CENTRAL PART OF ELY CATHEDRAL.

A. The Nave of the Cathedral.
B. The Ante-choir.
C. The Northern Transept.
D. The Southern Transept.
E. E. E. E. E. E. E. E. The aisles of the Nave, Ante-choir, and Transepts, which possess vistas from one to another, through the central Octagon of the Church, in the same manner as those at St. Paul's Cathedral, London.

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says, "By the people of Florence, the base of the dome of St. Paul's is said to have been suggested by "that of Santa Maria delle Fiore. By the clergymen of Ely, that the plan is a copy of their Cathedral. "*The octagon base, and the vista of the aisles through it, is together an invention not easily allowed even to* "*Sir Christopher Wren.*"—p. 20. new edition, A.D. 1822. And on the subject of the "appearance of "weakness where the greatest strength is required," Gauthey, the celebrated mathematical French bridge-builder, in his "*Dissertation sur les Dégradations survenues aux Piliers du Dôme du Panthéon* "*François, et sur les Moyens d'y remédier,*" p. 89. has the following remarks: "On peut voir dans tous "les dômes qui ont été construits que les piliers ont toujours été contrebutés dans le sens de cette "diagonale, soit par des massifs dans les angles comme à Saint-Paul de Londres, au Val-de-Grace, à "la Sorbonne, aux Invalides, soit par les voûtes des bas côtés comme à Saint-Pierre, à Saint-Charles "du Cours, etc., et que le dôme du Panthéon ne l'est que par des plates-bandes qui ne forment pas une "bien grande résistance." Here may, indeed, be added what Jean Rondelet says upon the same subject: "*Son plan, par le bas, forme un octogone régulier percé de huit arcades, dont quatre grandes ré-* "*pondent aux nefs, et les autres aux bas-côtés. Cette disposition ingénieuse procure des percés très inté-* "*ressans. C'est peut-être le plan de la coupole de Sainte-Marie-des-Fleurs à Florence qui en a fait naître* "*l'idée: mais, quoi qu'il en soit, il faut convenir que cet arrangement est beaucoup plus heureux que* "*celui à pans coupés qu'on a adopté dans les autres coupoles modernes; il a de plus l'avantage de former* "*une base plus solide, composée de huit piliers, et d'avoir des pendentifs moins saillans.*"—Traité Théorique et Pratique de l'Art de Bâtir. vol. iv. p. 167.

The truth is, that it does not require much discernment, to discover that in addition to the dome of St. Paul's having twice the usual number of primary supports, it has for abutments, all the eight lateral and transverse walls, besides the eight ponderous ranges of arcades with their solid piers, and in addition to these, it has the four great diagonal abutments formed by the weighty masses containing the staircase and vestries,—in all twenty unmoveable abutments. Somewhat indignant, that such absurd nonsense should be debited under the cloak of architectural criticism,—that any one should be found so anti-national as to depreciate that high-wrought skill which the most profoundly learned and accomplished have hitherto admired, and to the scientific merits of which, even a foreigner is not slow to do justice,—in order to have always before him, Wren's masterly problem solved in work, and to teach his workmen the knowledge of the sections of domes,—the author has just fitted up in his own residence, a small studio, about fourteen feet square, in the ceiling of which, the arched heads of windows doors recesses book-cases &c.,—are made to intersect with four triangular sections of domes, in the same manner as under the surpassingly exquisite sections of four domes, the aisles of St. Paul's meet in pairs. But after the weakness which has been found in the four great abutments of St. Paul's, it may be expected that a project will be formed for filling up the obnoxious vistas with "*concrete.*"

In the same publication, is a condemnation of the scroll-work used by Wren in the interior of St. Paul's:—without falling into any admiration of scroll-work generally, (and the author has no slight abhorrence of the *Louis-quatorzine* scroll-work) it may be demanded what buildings erected during the last three hundred years, that have any quantity of ornaments, have so small a proportion of scroll-work as St. Paul's? The truth is, Wren soared even in most of his ornaments much above his age, and certainly much above the present age: there is not to be found in St. Paul's, one half the quantity

378. The simple geometrical secret once disclosed, it is in many cases readily adaptable; and one fortunate instance of this adaptation, is to be seen in the Bank of England, where Sir John Soane having to make from the south entrance-court a new entrance to the great Rotunda, which lies askew from the court, overcame the difficulty successfully, by some way in bending the passage to it to an angle of 45° beneath a small triangular section of a dome, similar to the four spandrel-domes at St. Paul's: here the belting arches of the ceiling span correctly across the plan in straight lines, are of simple construction, and fit exactly the section of a dome. Not so that of the embouchure of the passage into the Rotunda, for there cutting into a semi-circular alcove to the spherical head of which it does not ascend, the arch becomes circular also on the plan, and thence distorted and weak, though much more difficult of execution.

379. After a young person, who intends to become a student in architecture, has acquired a fair knowledge of arithmetic and mensuration, he should acquaint himself thoroughly with the sections of spheres; this he may do from balls of wood or other materials; and the result will be, that in a very short time he will out-distance in practical scientific architecture all his competitors who pursue a different course; while he who merely attends lectures, at which little is to be acquired beyond the most superficial knowledge of the orders of architecture, (and which can in general be much better acquired from books) or who occupies all his time in making designs before he has acquired a solid elementary knowledge of art and science, will wholly fail.

It is not that he is to expect his designs to be chosen for their science, in competition with others; for he would wait long before he found judges in such cases able either to discover or to appreciate the science of his design, the public in general being perhaps less acquainted with the Practical Science of Architecture than with any other art, although every man's worldly estate and convenience

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of scroll-work which is to be found in a large proportion of the works of our own time: what with scrolls under entablatures, at the ends of entablatures, along friezes and cornices, upon attics, at the sides of blockings, and in all sorts of situations and attitudes,—what with the open encouragement of the depraved style of the age of Louis the XIVth, *scroll-work* seems here more in favour than ever. Wren's scroll-work is principally confined to such ornaments as the *Guilloche*, which in some form or other was made use of largely in the best ages of architecture, both by the Greeks and Romans. What architectural work, ancient or modern, is there, more beautiful and elegant than the exquisitely finished and gorgeous sculpture ranging all round the exterior of the Cathedral, between the Corinthian capitals? Where are to be found windows of a more beautiful character and finish, and which, though wide, have scarcely a stone of them displaced, while full fifty of the small windows of St. Bartholomew's Hospital have their lintels hideously fractured, and many of them in dangerous condition? And be it still repeated that St. Paul's stands on a quick-sand.

Where are to be discovered even upon classical ground itself, among the best works of the ancients, any things so magnificent as the sixteen great alcoves within the aisles and transepts of St. Paul's, through which windows are pierced, and the sumptuous heads of which are all wrought in solid Portland stone with the perfection of coffered-work, some with concentric circles of squares, some with diagonal squares, some with hexagonal panels, some with octagonal compartments, and others with panels of more intricate geometrical forms?

What Cathedral in the world contains any thing more fine than the aisles at the sides of the choir of St. Paul's, with their superb alcoves, and the gorgeous oaken stall-work of the choicest architecture, and which need only the progress of monumental statuary, and the substitution of scripture histories for the present plain glass, so as to increase the interest and enrich the tone of the architecture?

Oh! unarchitectural age! Age of lath and plaster! when thou hast acquired honesty enough to work in solid materials of value, and hast learned the scientific use of thy compasses, then sit in judgment upon, by an immeasurable extent, the most scientific and modest man who ever practised as a professional architect, in times ancient or modern, and before whom most other practitioners, will in England's chronology, sink into nothingness. The author is fully persuaded, that were any competent artist to publish an extensive work shewing the details of St. Paul's that it would produce as much surprise from the richness, high finish, and good taste of the subjects, as from its unequalled science.

The author would not have taken the trouble to make these remarks, were it not that the taste of the public and of those who have the ordering and management of our national buildings, is more led and governed by publications at twelve-pence each, than by scientific and artistic works, which costing perhaps fifty pounds, are confined alone to the libraries of the rich, the learned, and the noble, who are in general so much disgusted with the petty views and the expensive muddling which thwart our public architecture, that they will have nothing whatever to do with the direction of it.

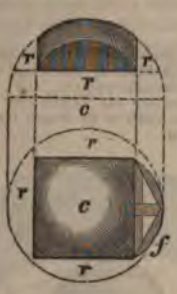
are most materially concerned with it: but after he shall have once found opportunity of showing his skill, accompanied by integrity, and by even a very moderate degree of taste, he will be sought for as one who can overcome difficulties, and upon whose ability reliance can be placed. Let him not forget, that Smeaton was sent for to build the Edystone Light-house merely from his known scientific acquirements, before he had built any thing, and that this great man's skill and caution soon made him one of the greatest of Engineers.

380. The following are some of the most useful sections of spheres, cut to suit vaultings to ground-plans of different shapes :—

Plans and Elevations of Twelve of the Chief Examples of Hemispherical Vaults, vulgarly termed "Pendentives."

No. 1.

HEMISPHERICAL DOME, cut to fit a Plan in the form of an EQUILATERAL TRIANGLE.



No. 2.

HEMISPHERICAL DOME, cut to fit a Plan in the form of an exact SQUARE.

No. 3.

HEMISPHERICAL DOME, cut to fit a Plan in the form of a PENTAGON.

No. 4.

HEMISPHERICAL DOME, cut to fit a Plan in the form of a HEXAGON. *The Plan may be made with the sides of it alternately differing, or like an Equilateral Triangle with its angles cut off.*

No. 5.

HEMISPHERICAL DOME, cut to fit a Plan in the form of a REGULAR OCTAGON. *Any other number (even or uneven) of sides may be chosen for the Plan.*

No. 6.

HEMISPHERICAL DOME, cut to fit an IRREGULAR PLAN, the angles of which TOUCH THE CIRCUMFERENCE OF A CIRCLE. *This instance is given in order to shew that an irregularity, either obvious or imperceptible, does not of necessity prevent an apartment from being covered with a dome.*

No. 7.

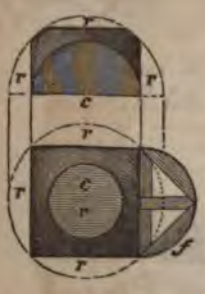
HALF A HEMISPHERICAL DOME similar to No. 2., cut to fit a Plan in the form of an ISOSCELES RIGHT-ANGLED TRIANGLE. *This is the form of the Domes under which the side aisles of St. Paul's Cathedral meet next the Dome.*

No. 8.

HEMISPHERICAL DOME, cut to fit a Plan in the form of a PARALLELOGRAM. *Of this kind are the Domes over the side aisles of St. Paul's Cathedral.*

No. 9.

HEMISPHERICAL DOME, cut to fit a Plan in the form of an OCTAGON WITH SIDES ALTERNATELY DIFFERING. *The four smaller sides of the Polygon with the arches over them may be omitted, and the Dome will then spring from four curvilinear Piers.*



No. 10.

FRUSTUM OF A HEMISPHERICAL DOME, cut to fit a Plan in the form of an exact Square, and finished with a flat ceiling or with a skylight. *The heads of all kinds of domes may be truncated away in the manner of this dome.*

Between the eight great central arches and the Whispering-gallery of St. Paul's Cathedral, is a Frustum of a Dome like this, with an Octagonal Base like No. 5.

No. 11.

FRUSTUM OF A HEMISPHERICAL DOME, cut to fit a Plan in the form of a Hexagon, and surmounted by a smaller *complete* Hemispherical Dome. The same Frustum may be surmounted by another Dome of any shape, by a Cylinder or *Drum*, or by a Conical collapsing Pilastrade, as at St. Paul's Cathedral.

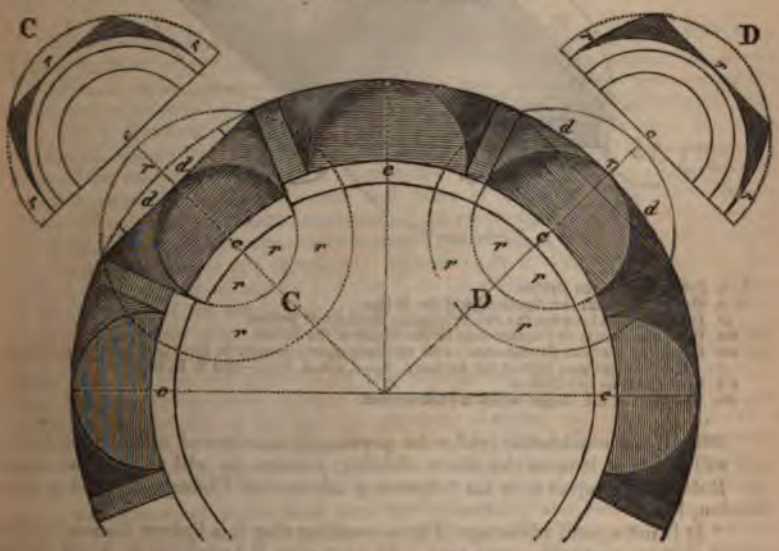
No. 12.

UPPER SECTION OF A HEMISPHERICAL DOME, cut to fit a Plan in the form of an exact Square. *All the lateral arches cutting into this kind of Dome, have their curvatures struck from the same altitude as that from which the spherical surface of the dome is struck.*

The curvilinear surfaces of all the twelve Examples of Domes here given, are generated from Hemispheres of the same diameter, the centres of which are marked by the letter *c*: in all the twelve Examples, the letter *r* indicates the *portions of the Hemispheres which are retrenched*: and against the letter *f* are given the *face-ribs* of the arches uniting the walls with the Domes.

CHAPTER XLII.

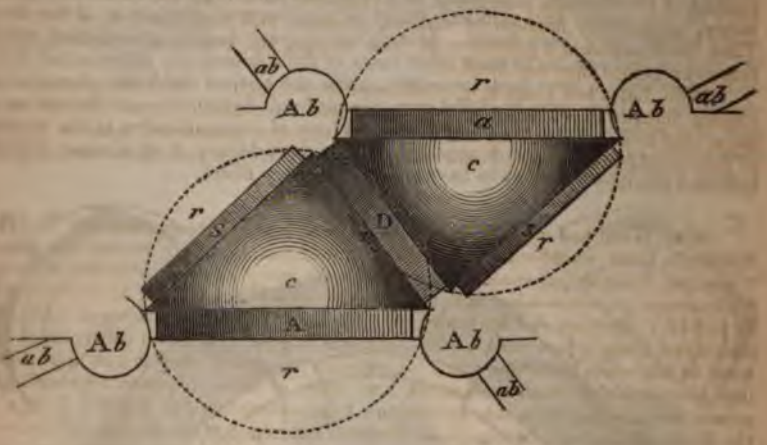
381. Perhaps the most curious instance of the application of the sections of Domes, is to be seen in the ceiling of the circular front vestibule of the East India House, London: it consists of eight similar spherical sections, set radially with eight ornamental circular bands between them; they rise from an entablature over eight Corinthian pilasters, and all meet a circular central ceiling: moreover the upper part of each spherical section is also cut off, so as to afford round the central ceiling, eight smaller flat compartments which are nearly semi-circular. Had the architecture of this vestibule been in a style bolder and more noble, any thing more exquisitely beautiful, and differing more from the great body of the coarse and skill-less works of architectural plagiarism of the day, could hardly have been found. In only one respect does its geometrical truth fail, and in that case, as in most other cases of such failure, the expense and difficulty of execution have been increased, while the science and beauty have been diminished. How very beautiful may this piece of design be made for the support of a gallery round a circular Hall or Saloon of communication in the centre of any kind of edifice! It is capable of the highest degree of enrichment, and of various modifications, so as to have an extraordinary effect.



c. Centres from which the eight Sections of Spheres are generated.
r. Parts of the Spheres which are retrenched.
D. Plan and Elevation of one of the eight *Defective* Spherical Sections as executed.
d. *Distorted* Base-line of each of the eight Spherical Sections, cut to agree with the great circle of the Plan of the Vestibule, thereby rendering the eight side arches in the head of the wall which cut into the eight spherical sections, lower than semi-circular arches, and thence distorted, imperfect, and more difficult of execution.
C. Plan and Elevation of one of the eight spherical Sections as they should have been executed, so that the eight arches next the wall of the Vestibule (which contain eight windows and recesses), might *correctly* span with true semi-circles, from pilaster to pilaster.

382. Triangular sections of Domes may be even made applicable for the vaultings of *Skew-bridges*, a description of works of no slight importance, since from the increase of canals and railroads passing over or under common roads, at oblique angles, these contrivances, often so ill-shapen and so difficult of execution have become almost absolutely necessary: it is not pretended that this application of Domes will ensure beauty, though there may be favourable occasions when even that may be obtained from their use: the author contents him-

self with simply pointing out that they may be used, and that by their use, both laying the brickwork or masonry spirally, and cutting any stone voussoirs askew, are avoided. If the bridge cross at an angle of 60 degrees, two equilateral triangular Domes similar to No. 1. may be used; if it cross at an angle of 45 degrees, two such as No. 7. will be proper: if the arch of the skew-bridge be long, it may require one or more such Domes as No. 2. or No. 8. to be inserted between the triangular Domes,—and such a series of Domes may make the work beautiful; or, instead of them, a plain vault may be used.



A. *a*. Face-arches of the Bridge.
S. *s*. Side-arches next the Abutments of the Bridge.
D. Diagonal-arch between the two Triangular Sections of Domes.
A*b*, &c. Four Abutments or Counter-forts at the angles of the Bridge.
ab, &c. Retaining Walls or *Revêtements* to be severally placed exactly in the right position for resisting the combined drift of the Arches A, S,—*s*, *a*,—A, D, *s*,—and S, D, *a*.
c c. Centres of the two Domes.
r r, &c. The parts of the Domes which are retrenched.

383. If the unscientific reader be previously uninformed upon this subject, and will not take it upon the above shewing, perhaps he will regard that which Dr. Robison says upon it in his "*System of Mechanical Philosophy*," vol. i. p. 659. Edition, 1822.

"It is not a small advantage of dome-vaulting that it is lighter than any other "kind that can cover the same area. If, moreover, it be spherical, it will admit "considerable varieties of figure, by combining different spheres. Thus a "dome may begin from its base as a portion of a large hemisphere, and may be "broken off at any horizontal course, and then a similar or a greater portion of a "smaller sphere may spring from this course as a base. It also bears being in-"tersected by cylindrical vaultings in every direction, and the intersections are "exact circles, and always have a pleasing effect. It also springs most gracefully "from the heads of small piers, or from the corners of rooms of any polygonal "shape; and the arches formed by its intersections with the walls are always cir-"cular and graceful, forming very handsome spandrels in every position. For "these reasons Sir Christopher Wren employed it in all his vaultings, and he has "exhibited many beautiful varieties in the transepts and the aisles of St. Paul's, "which are highly worthy of the observation of architects. Nothing can be "more graceful than the vaultings of the north and south transepts."

And here it may be said, that thousands of us know all this, and a great deal more, relative to domes: no doubt this is true;—but of what value is our know-

ledge, if we make no practical use of it? Possessed of this knowledge, how is it, that full half of our modern English architecture, amid vain and impertinent boasting which has no parallel in the history of art, is constructed in defiance of every principle of science, and consists even in its decorations, of nothing more than an ill-disguised petty larceny of only two very small ancient Athenian examples? Can cornices, skirtings, architraves, window-dressings, panels, brackets, and a thousand other knick-knacks, in poverty of spirit all profiled in deal, lath and plaster, after the pilaster-capitals of the choragic monument of Thrasyllus,—can works in putty and gypsum, slightly deranged from the Corinthian capitals of the choragic monument of Lysicrates,—atone for the omission of symmetry, proportion, fineness of outline, science, and excellence of structure? Time itself seems in a passion with these things, and commences their destruction even before they are finished.

Who, but a few years ago, could ever have imagined, that the pretence of science and the depreciation of building, could have arrived to so unblushing a state, that even a Church of the nineteenth century, sometimes consists merely of four sand-banks, covered over with about one eighth part of an acre of plain lath and plaster?

384. Wren had more science in his head and heart, than a thousand Sir John Soanes in their whole souls and bodies. "*Lorsque la nature produit de pareils "hommes, il semble que la société ne manque pas non plus de faire naître le besoin "d'ouvrages qui soient à leur niveau.*" (De Quincy's Plus Célèbres Architectes, vol. ii. p. 244.) Science and humanity ennobled all Wren did,—fevered littleness destroyed Soane's best works. Sir John was in general a sound constructor, but none of his works shew one spark of superior science; they are all subdivided into comparatively small apartments, and none of them required extraordinary means for carrying them into execution; from succeeding Sir Robert Taylor at the Bank of England, he came to understand something of the sections of domes*; but his groined vaults are frequently imperfect, their diagonal arrises are distorted, from the want of science and true taste for architectural geometry. Many of the interiors of his works, have such an appearance of lowness and ill-proportion, that they seem more like burial-crypts than public halls. The tricks and multitudinous alterations, which he essayed in the attic terminations of his buildings, shew that he was not gifted with the economical, successful, and satisfactory quality of perfecting his elevations before the commencement of the work: he could not for the soul of him fall into grandeur of style; he could not leave a surface of six inches without tattowing it over. When a building reached twenty feet in height, he was impatient to break its outline: he does not appear to have worked by proportion, but by feet and inches; he appears to have dreaded to make a column much more than two feet diameter; the consequence is, that most of his buildings are over-crushed at the top with all manner of inventions, and yet are not much more than half the height of the adjoining private houses; he had some love for the orders of architecture, but he preferred to them his own inventions, and crushed them by the latter. All his works are a collection of littleness; many of them are picturesque, but still littleness is the character of them, as it was of their designer. The huge Bank of England, one of the most widely-spread piles in the world, with all its beauties, (and many of them are very eminent) appears small; the exquisite bit of architecture at the north-west corner of it, by Lothbury, appears at a very short distance now a street is opened against it, like a mere toll-house,—while the neighbouring Church of St. Mary Woolnoth, one of the smallest buildings in the world, appears, with all its faults, truly grand and delightful. The Bank appears lower and smaller from being

* Nearly all the descriptions of vaultings used by Soane, are even to be seen in the house of Sir Robert Taylor, at Spring Gardens, London, including the double-pointed groin.

opened to view, and from having handsome buildings erected in its vicinity ; the Church of St. Mary Woolnoth, seems on the contrary, grander and nobler the more it is exposed, the more other buildings are contrasted with it. The author was always struck with the greatness of appearance of this little building, possessing such a happy union of breadth loftiness and simplicity, combined with richness intricacy and originality ; and unfeigned satisfaction has been caused to him by opening it more to public view : yet, as a work of science, this does not rank high ;—how incommunicable may be the *superior* geometrical and other skill of a Wren, is proved by this and other works of the pupils and assistants of the great master ; for they hardly exhibit even the commonest acquaintance with science. How beautiful would Hawksmoor's designs have been, if directed and charmed into proportion by the mental accomplishments of Wren!

385. In closing this chapter upon *The Decline of Geometrical Science in the Architecture of England*, and to instance one example from amidst countless others, of the enlightened skill which pervaded the works of our forefathers, the outlines

Six inner columns.
Twelve outer columns.
Six inner equilateral triangles.
Six outer equilateral triangles, between six exact squares.
Six vistas, each presenting eight columns,
Each angle of the triangles 60°.
Each angle of the squares 90°.
The angles of the several compartments surrounding each of the six inner columns sum up to 360°.

of the Plan of the celebrated circular vestibule of the Temple Church, London, are given : the author has done this, because, although many have written upon this peculiar fabric, he does not at this time remember that any one of them has dwelt upon the high *geometrical* excellences and wonderful peculiarities of this exquisite plan, which he at present believes to be unrivalled in the world. The perfections of the Plan consist in one measure or module, by the unalterable laws of geometry, pervading every part of this apparently intricate Plan, this is the radius of its inner Peristylium ; this common measure produces the six inter-columniations of the inner Peristylium, forming on the Plan a hexagon, and the twelve inter-columniations of the outer Peristylium forming a duodecagon,—this common measure gives the distance from the inner columns to the outer columns,—whichever way the eye is directed a vista of columns and arches is afforded, perfected and limited by the same common measure : and to crown the beauties of the simple but highly scientific and matchless composition, the ceiling within the inner Peristylium consists of six exact equilateral triangles, and the ceiling between the two ranges of columns consists of six exact equilateral triangles alternating with exact square groins.

In the work itself there may be some trifling inaccuracies, but these take nothing from the perfection of the *principles* evolved by the design ; and it should be further noticed, that instead of the arches being carried straight across from column to column in each Peristylium, they are made circular on the Plan, by which their difficulty of execution was increased, while they were rendered weak in construction, and ugly and distorted in effect.

386. The excellencies of this Plan, may be transferred to other styles of architecture : a very beautiful vestibule of moderate dimensions might be formed upon the same geometrical principles, retaining the compartments of the outer Peristylium

for the support of a gallery, but omitting the inner columns, leaving instead of them six pendents, ornamented in some way with figures, foliage, or any thing else which the architect might design.

387. But a most fairy-like small apartment, might be formed almost after the vestibule of the Temple Church, with the twelve outer inter-columniations (the door included) lined with looking-glass: such an apartment lighted up, with its real and reflected repetitions of arches, columns, vistas, chandeliers, and other objects, would perhaps cause more surprise and delight, than any applications of geometry and mirrors have hitherto produced.

388. The twelve sections of Domes above represented (§ 367) will shew in what different manners the various compartments of this Plan may be vaulted over, so as to avoid every inaccuracy, and to produce the highest degree of elegance. The examples Nos. 1, 2, 4, 10, 11, and 12 are all proper for this purpose.

CHAPTER XLIII.

Of the Three Different Great Constructive Principles in Building.

389. In disposing the materials for the construction of Buildings, there are *three* distinct great principles called into use :—

Simple Repose,
Equipoise,
Tie.

The object in all these three distinct principles, is the production of such a state of quietude in the materials of a building, that their weight shall not produce any fracture or displacing of them.

CHAPTER XLIV.

Of the Principle of Simple Repose in the Construction of Buildings.

390. The principle of Simple Repose, in the construction of buildings, *is used where the materials are merely piled up perpendicularly, so as to form piers or columns, with cross-beams architraves or lintels,* laid *horizontally upon the piers or columns, pressing downwardly merely with the gravity of those materials, without any thrust or other inclination to destroy the position of any part of the arrangement.* All very ancient buildings, are formed upon this construction. This construction, is destitute of all science, yet it is as far as its capabilities go, more perfect in its known principle, than any other construction: this is proved, by the enormous duration, of the temples of the Egyptians, Greeks, and Druids, which were formed upon this principle: it needs no calculation, for obtaining equipoise, or for the avoidance of the pendent materials wedging apart those supporting them: buildings constructed on this principle, need only tenacity of material and unflinching foundations, to be altogether perfect in construction: but buildings of this kind, owing nothing to geometrical science, lead to an enormous consumption of materials; all the materials of the horizontal spanning masses, of even a small building, must be huge, and are thence immensely expensive, to procure, and to raise to their destined places; if these spanning masses be either so long or so brittle as

to yield by their own weight, or by that which may be put upon them, the principle of *Simple Repose* becomes destroyed; the horizontal masses sink, and the piers or sustaining masses are thrust outwardly. From the many columns, or props,

required for the support of a roof or covering upon this principle, the internal space is greatly impeded. This principle affords great external beauty, but leads to internal comparative uselessness; hence most of the large Grecian buildings, as temples and theatres, were left roofless.

In fact, as far as we know, the Greeks were incapable of covering over a clear and extensive hall; hence arise the barbarism and total failure, which are exhibited by the attempt to cover over with a pseudo pretended Grecian flat ceiling a building of great dimensions: a building so covered, always appears mean proportionless and disgusting. A people of intellect so refined as were the Greeks, after acquiring the knowledge of vaulting, could never have tolerated any thing so graceless as a low flat ceiling.

391. A more advanced state of science, produced greater results from contemptible materials: in *Saint Paul's Cathedral*, London, there are a million times more practical science, of the higher kind, called into action, than in all the buildings of Greece and Egypt; and yet, perhaps, *that* exquisitely artificial combination, will hardly survive *their* ancient remains.

But an attempt in modern times to revive the skilless principles of Grecian structure, without the use of Grecian masses of stone, has thrown architecture into humiliation and fractured confusion, unparalleled in the history of art.

CHAPTER XLV.

Of the Principle of Equipoise in the Construction of Buildings.

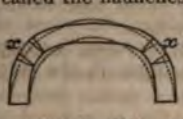
392. Equipoise in the construction of buildings is made use of where smaller, even the smallest, materials, are piled up, upon the *principle of the arch*, upon piers or columns: this principle, *from the triumph by which it enables science to overcome the smallness and meanness of materials*, admits of the grandest masses, being reared cheaply: theoretically it should be perfect; *but from the complicated principles which it involves, it is very frequently more or less imperfect;* but even with its frequent practical imperfections, it has proved for many ages, the means whereby man is enabled, to arch, to vault, and to dome over, large buildings, in a manner in which otherwise he could not.

CHAPTER XLV.

393. Almost all simple arches and vaults, have a tendency more or less, to thrust apart the abutments which support them; to prevent this disastrous effect, these abutments require to be sufficiently weighty, or even to have a tendency directly falling towards the thrust of the adjoining arches or vault, so as by counter-gravity to counter-act their expanding property.

394. The flatter be the segment of the circle composing an arch or vault, the greater is the thrusting or wedging power of the arch or vault against the abutments; consequently, the greater must be the strength and gravity of the abutments, to counteract the otherwise irregular settlement of the work. *This is one of the principles of equipoise.*

395. Again there is another grand instance, in which the principle of *equipoise* is demanded. All semi-circular or segmental arches, vaults, and domes, if consisting of a crust of materials *equally thick all over*, that is with their internal and external curvatures which are technically called the *intrados* and *extrados*, concentric or parallel to each other, in all such arches, vaults, and domes, the upper materials being least supported by the abutments, are most in jeopardy, have a more direct tendency to fall by their own weight, and becoming thus depressed, they wedge upwardly the materials next them, at those parts of the curve which are vulgarly called the haunches of the arch, vault, or dome, forming a distorted curve, thus,



work, near the parts *x x*; and frequently leaving vents in the as it were, by a succes- now a dome or cupola, being formed sion of half arches, meeting together at the crown, *if that crown become depressed, it must force out the haunches of the work, all round in a circle, at the parts x x; and this same quantity of solid materials, being forced to occupy a greater circumference, the enlargement can alone take place, by openings or vents occurring there:* from this very defect, some of the grandest cupolas in the world, have become greatly endangered, and some have wholly failed.

The thinking man, who despises not a homely illustration, will see this most scientifically and beautifully exhibited, by the effect which constantly takes place, with a common fruit pudding, the crust of which is thin.

396. To *remedy* this *ruinous defect*, it becomes necessary to *add upon the haunches of arches and vaults, weight sufficient to hinder them from flying up*, and thus *prevent their crowns from falling down.* In arches in ordinary walls, weight upon their haunches is usually of necessity obtained, by the ordinary process of carrying the walling up to its destined height; and the backs of vaults are in general filled up solidly, nearly to a level with their summits: but in cupolas, which are raised for shapely magnificent external ornaments, to cathedrals and other grand edifices, the required beauty of external outline, almost denies the producing an equipoise in the thickness of the crust of the work, without an enormous sacrifice of materials, and danger to the foundation from the weight of the upward work; hence to produce the requisite effect, some of the noblest energies of the scientific mind have been called into action; not the least display of this, is the use of the intermediate conical dome, as at St. Paul's Cathedral, which besides having no tendency whatever to fly out at the haunches, is able also to bear the heavy surmounting lantern or spire, and is itself in fact a steeple.

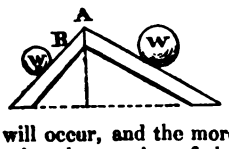
397. And with regard to this last most admirable piece of secure science, it has been judiciously observed, that the weight of the timber-work and covering of the outer dome of St. Paul's Cathedral tends to prevent any possible outward spread of the cone itself.

" Le mur de la tour conique est élégi par quatre rangs de fenétres qui

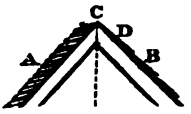
" éclairent l'intérieur de la charpente ; le bas de cette tour est contrebutté par " trente-deux murs en éperons tendant au centre, ils sont compris entre le mur " de l'attique qui est au-dessus de la colonnade extérieure et le mur de ladite " tour.

" Les éperons servent aussi d'empatement pour porter l'enrayure de la char- " pente du dôme. Cette charpente est composée de trente-deux demi-fermes, " appuyées d'un coté sur l'extérieur de la tour conique, et portant de l'autre une " courbe pour former le galbe du dôme ou la coupole extérieure. *Il résult de* " *cet arrangement, que tout le poids de cette charpente et du plomb dont elle est recou-* " *verte, sert à contre-venter la tour conique.*"—Jean Rondelet " Traité Théorique et Pratique de l' Art de Bâtir," 6th Edition, vol. iv. p. 388.

398. A frequent instance of the violation of the principle of equipoise is to be found in the roofs of Buildings, occasioned by the slanting sides of them, being either of unequal dimensions or covered with materials of different densities : if the rafters be longer and more ponderous on one side of the ridge than on the other, thus,



the weights (W w) cannot counteract each other, but the greater weight will thrust over the ridge A towards B. Again if the rafters be equal, but the covering of one side of the roof be heavy as of plain-tiles, and of the other side light as of slates, the same effect will occur, and the more ponderous covering A overpowering the gravity of the lighter covering B, the ridge C will be driven towards D.



399. Those who are careless in the adjustment of their buildings, or who cannot duly feel the shame of fracture in them, may argue that they have provided strength enough to resist all such effects : however this may be (and it may well be doubted) no additional strength ought to be required for any such purpose ; for a small quantity of materials put together artificially, by a due knowledge of gravity and dynamics, must be more secure as well as more economical, than heavy masses, which being ill at rest, strain every joint of the rafters and trussed work, operate against every wall, and leave nothing as it was originally intended to remain.

400. Although one cannot at this distance of time quite understand the nature of the damage, and although we must assign a portion of the condemnation to result from the *general* ignorance and disdain of Pointed Architecture then prevalent (albeit no one perhaps understood better than the great architect, the outline, statics, and construction of mid-eval architecture) yet we cannot but admire the high degree of constructive art, and the prudent caution manifested on the subject of equilibrium, in the following account by Sir Christopher Wren, of the overhanging of the southern parapet of Westminster Abbey.

" The Abbots would have a Cloyster, but scrupled, I suppose, at moving " some venerable Corpses laid between the Outside Buttresses ; then comes a " bold, but ignorant Architect, who undertakes to build the Cloyster, so that the " Buttresses should be without the Cloyster spanning over it, as may be seen in " the Section."

" This was a dangerous Attempt. It is by due Consideration of the Statick " Principles, and the right Poising of the Weights of the Butments to the Arches, " that good Architecture depends ; and the Butments ought to have equal Gravity " on both sides. Altho' this was done to flatter the Humour of the Monks, yet " the Architect should have considered that new Works carried very high, and " that upon a newer Foundation, would shrink : from hence the Walls above the " Windows are forced out ten Inches and the Ribs broken. I could not discern

"this Failure to be so bad, till the Scaffold over the Quire was raised to give a close "View of it; and then I was amazed to find it had not quite fallen. This is now "amended with all Care, and I dare promise it shall be much stronger, and "securer than ever the first builders left it."—*Wren's* "*Parentalia*," p. 298.

CHAPTER XLVI.

Of the Principle of Tie in the Construction of Buildings.

401. TYING is the third great principle in the construction of buildings; and is *comparatively* of modern invention. That state of rest, which the ancients endeavoured to obtain by the principle of *Simple Repose*, and by *Equipoise*, is by the *Principle of Tying* obtained through confining the thrusting power, not by external abutments and equipoise, but by *internal restraint*; it leads to the most exquisitely simple, and beautiful mechanical contrivance, perhaps ever invented: this contrivance is technically called a TRUSS: nothing can be more simple, yet nothing requires more care in its construction; it contains in itself the seeds of ruin, and the safe and perfect cure for it: the *inclined beams* forming a truss would be violently striving to work the ruin of the building, by thrusting apart and throwing down its walls, but the *horizontal tie-beam* restrains them: *the inclined beams must not reach the walls*; they must *only come upon the tie-beam*; then while the tie-beam remains unbroken, *the truss lies simply with its bare weight upon the walls*: there is then *no thrust, no cross strain* upon the walls: such a mechanical contrivance is the most wonderful economiser of materials: it may be applied, more or less simple, in a thousand different ways: well applied, it gives to every part of a building, however large in dimensions, that state of rest which the earliest buildings of antiquity possessed; while it enables man, with roofs, beams, floors, galleries, hanging partitions, and platforms, to span enormous widths, which the ancients never could without a prodigious outlay, and frequently not without great inconvenience. The principle is so exquisitely beautiful, so mathematical, so powerful, yet so simple and so cheap, that every gentleman who is a builder, should be acquainted with it, and it would cause him very great delight; and his knowledge in this simple fact alone, would save him in the construction of his own buildings, an infinite deal more outlay, than he could previously conceive; while it would render his buildings, infinitely better, and more durable.

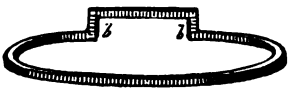
402. *Every employer, every master-builder, every workman, should understand thoroughly, this great but simple principle, in all its combinations:* but alas, such is the folly or obstinacy which presides over building, that *from the neglect of this simple principle, the Metropolis of England,* is (most of its public buildings excepted) *almost all one shaming mass of ruin: two thirds of its houses, have their walls thrust out, by their unrestrained roofs; their floors sinking from want of judicious support; and their timber partitions, groaning beneath the weight of ill-placed roofs and floors:* AND THE GREATER THE QUANTITY OF MATERIALS, THE GREATER IS THE RUIN, CAUSED BY GREATER GRAVITY, ACTING BY CROSS-STRAIN, THRUST, TEARING, AND SINKING.

403. A curious and instructive speculation would it be to ascertain, if possible, how many times greater than the outlay requisite for obtaining finely constructed edifices, and for procuring the care and talent requisite for so forming them, is the annual cost of rectifying our English buildings, public and private, by the usual expensive processes of under-pinning, furring up, furring out, stopping cracks, adding buttresses props and columns, putting braces and ties of

wood and iron, lightening roofs, strengthening floors and walls, and by the various other ruinous remedies, by which at present is squandered more money than would suffice to render England a Nation of Palaces, which when England's glory shall be sunk and her present Church architecture shall be all crumbled away, might render her soil classical, and make the traveller in after ages exclaim "Here dwelt a scientific and tasteful race of men."

404. All ties made use of in Buildings, should be either straight or only *cambered* or curved upwardly enough to allow for that downward settlement which mostly takes place in all pendent materials. No crooks should be made in ties whether of iron or other materials; if an iron tie be bent thus,

either it has no strain to counteract, or it will soon gradually straighten at the bend *a*, and thus lengthening will offer no restraint to the moving power. When ties form complete hoops or circuits, as those round a dome or steeple, they should if possible be each in one piece or at least in as few pieces as possible, and they should lie horizontally in every part. One of the chain-ties round the spire of the church of St. James Clerkenwell, is crooked thus,

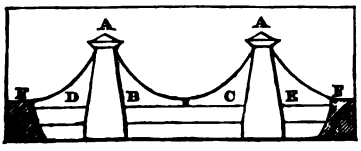


at the letters *b b*, in order that it may accommodate itself to the blocks of stone composing two of the eight piers of the spire: thus is this iron chain-tie altogether useless: hence it is the more necessary that the foundation and the other chain-tie of the structure should be preserved: but this, under a pretence of church reform and other reasons equally absurd, the parishioners refuse to do—while money enough is found for expenses of little use.

CHAPTER XLVII.

Of the Union of the Several Great Principles of Construction in Buildings.

405. Most modern buildings, contain more or less of the *Three* several great principles of construction combined together.



A suspension bridge, contains all the three principles: thus at the points A A the chains should merely lie, if possible, with nothing but their mere gravity, in simple repose: again, the divisions B and C of the chains, should be in exact equipoise with the outer divisions of the chains D and E; thus the whole would be equally balanced, as exactly as a scale-beam, with the towers supporting the fulcrums A A merely compressed downwardly, without being strained, or thrust from their original situations and form, and at least without any but equal strains. And thirdly, as the chains of the *catenary*, are striving by their own weight, to disengage themselves from the shore at the two points F F, they call into action the third principle of tie, to restrain them.

406. The theories of Catenary bridges, are very perfect; but then the mechanical arrangement of them, is so sensitive, that the slightest addition of weight, especially that of a passing carriage, or of a file of soldiers, deranges their equilibrium, and produces such an alteration, that rollers are required for the free action of the chains, at the fulcrums A A; added to which inconvenience, there is a prodigious inclination to fracture at the points F F; and yet with

these defects, suspension bridges, are so very beautiful, to a stranger so unexpectedly beautiful, they are so economical, so capable of being erected where no other bridges perhaps could be erected, that they form one of the noblest, most useful, and most successful inventions of man. Other bridges *thrust against* the shores, suspension bridges *draw away violently from* the shores. If Engineers ever succeed in rendering their horizontal roadways, by longitudinal beams and braces, so unflinching that they will not shrink in length, by the efforts of the external chains, at F F, then may such bridges, merely lie upon abutments at their junctions with the shores; and while their chains themselves last, no fracture may be feared.

407. It may be observed that some of the Suspension bridges which have failed, have not had their four great divisions adjusted in equilibrio:—if such an adjustment be not the principle of its design, a Suspension bridge will have its fulcrum-towers drawn over from the perpendicular, and an increased strain will be given to the abutments of it. Some of the handsomest and best suspension bridges, as that of Hammersmith, and the present Pont des Invalides at Paris, are formed nearly with an equalization of the gravity of their four great divisions.

CHAPTER XLVIII.

Gravity the Source of all Principle and Defects in Architectural Construction.

408. GRAVITY is the source of all the Principles Inventions and Ingenuity, called into action in the structure of Architectural Works. The weight or downward-tendency of their materials, is the cause of buildings holding together or falling or being thrust apart. *Gravity in its various Dynamic modifications*, is the sole acting power which operates in a building, unless forces (as of machinery) be applied which are not usually applied within a building. The *gravity* of an *imperfectly* formed roof, *thrusts out* and sometimes even overthrows the walls; the *gravity* of a *perfectly* formed roof holds those walls together: the gravity of a sinking floor draws *in* the walls of a building: the gravity of a common valley roof, by leverage *expands* and overthrows the walls: the gravity of the different stones composing a column, holds them firmly together: the gravity of the voussoirs of an arch constructed properly (if possible) causes all those voussoirs to press with an equal weight towards the centre of the curve: the gravity of stone vaulting operates against the walls of a church, and the gravity of the Flying-buttresses counteracts that active force.

W, W, Weights.
A, An unrestrained roof, thrusting out the walls of a building.
B, A floor sunk by gravity drawing in the walls of a building.

409. All the mechanical perfections of scientific building, result from a clear knowledge of the operations of gravity, and from the ability to direct their course: all the mechanical defects of buildings, result from an ignorance of the laws of gravity, and from inattention or from inability to counterbalance their effect. A judicious architect, enslaves to his purpose the active force of gravity, and compels it to exert *all* its force in holding together more firmly his structure: an ignorant or careless architect or workman, allows that force to exert itself in wracking, straining, distorting, breaking, and destroying his work.

410. By far the greater portion of the generic beauties of architecture (particularly of Gothic or Pointed architecture) have arisen from an intimate acquaintance with the operations of gravity, and from the consequent art of restraining it.

This may be characterized as the age most eminent for the display in the major part of its buildings, of inattention to gravity.

411. A child, in piling up a fabric of cards, displays a far better knowledge of gravity and dynamics than the greater part of modern builders: were it otherwise, how could ever have come into use to so enormous an extent,—so disgraceful and ruinous a piece of mal-construction as the common V roof, which is either a roof turned upside down, or two halves of a roof bearing upon void instead of upon the walls, and by its gravity endeavouring to fall flat like an open book? No excuse whatever can be made for this shamefully absurd piece of ignorance and improvidence. The shallow pretence of saving one gutter, is destroyed by the waste of timber in the gutter-plates, and by the consequent extra altitude of the walls.

a. Gutter-plates, bearing principally over void, and sunk so as to leave no current to the Gutter.
b. One side of the Roof by its weight thrusting over one of the Walls from *c* to *d*.
e. e. The Rafters, at bottom punching in the Gutter-plate, and at top thrusting against the Walls.
f. Rafters of an adjoining roof, by the equal counter-action of which alone the Party-wall remains erect.

412. A child by delicacy of hand, and exact poise and counter-poise, without cement, tenon, joint, or glue, can raise up a fabric of cards; but the grown builder, staggered and lost amid his mortar, cement, tenons, nails, spikes, hold-fasts, screws, glue, cramps, and braces, forgets all that providence by which a small quantity of materials may be made to hold up firmly without any of these things, and with the addition of which extra stays and connexions, with increased firmness, and so that none of the active force of gravity may be exercised against these additional means of union. The Romans piled up the stones composing many of their best works, dry and without cement, and yet many of them still subsist without flaw, and with their joints gravitating so closely as to be scarcely discernible. He who cannot in this surpass the Romans in these times of superior science, is no architect, no engineer, no builder. Cements or pegs made use of in a fabric, the materials of which would without them by gravity assume some distorted form, are less employed for strength than to counteract the ignorance of the fabricator: these things should be used, to make a small quantity of materials rightly placed, perform the same duty as a larger quantity of them would without such aids.

413. Perhaps one half of the number of dwelling-houses in London, have their roofs of the V form of malconstruction: these houses are all more or less cracked, twisted, and distorted: there can be no doubt that the same or even less quantity of materials, could be at first set up so as to endure without failure, and to save the expense of ultimate repairs and the discredit of permanent ugliness and distortion, and the outlay thus saved, might be applied in enlarging or beautifying fabrics which at present dishearten by their constant ruinous condition. This same valley roof, by its suit of extravagance, eats up that labour, and dissipates those funds which might fill our metropolis with granite porticos and towers, and yet it is but one of the instances in which the LAWS OF GRAVITY ARE DISREGARDED BY US.

CHAPTER XLIX.

Of the Three Modes in which Gravity Acts upon Materials.

414. GRAVITY (by their own weight and by the weight added to them) operates in three ways upon materials, which three ways, though so obvious, are frequently either so little known to the practical builder, or if known, are so little attended to, as to cause the most ruinous effects.

1st. BY SIMPLE COMPRESSION. 2dly. BY CROSS STRAIN. 3rdly. BY TENSION.

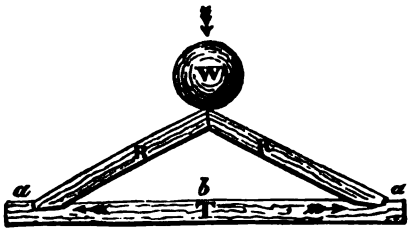
(W. signifies the force of Gravity.)

415. Of these three operations *the first is the least destructive*, and when the force of compression is not too great, it forms the principle of the best construction, and enters the most largely into all well-constructed buildings: all the materials which are placed in *Simple Repose* gravitate in this manner.

416. A concentration of this compression occurs to the key-stone of an arch by its own gravity, by the weight bearing upon it, and by the gravity and lateral operation of the adjoining Voussoirs. The same operation of compression occurs when a wedge or screw is forced under the base of a column or post, but gravity tends on the one hand, to draw away the apparatus, and on the other, to bring down upon the apparatus the mass forced upwardly.

V. V. V. Voussoirs.
W. W. W. Weights pressing the central Voussoir.

417. The same gravitation acts horizontally against a level strut set against a bulging wall, or other member of a building: it acts in the same manner against the abutments of a tie-beam, by the operation of the principal-rafters, but in this case the force endeavours to rend them from the rest of the timber, and the abutments are usually assisted by a bolt or brace of iron.



R. R. Rafters.
T. Tie-beam strained on each side from *b* to *a*, by the gravity of the materials of the Rafters and covering.
W. Gravity depressing the Rafters at their heads, and expanding them at their feet.

418. The same operation occurs obliquely upon a strut, set to prevent the bending in of a rafter; and this last description of compression, occurs to the head of a Gothic Flying-buttress caused by the drift of the Vaulting.

R. Rafter.
W. Weight.

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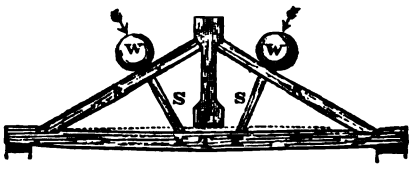
419. The second mode in which materials are operated upon by gravity, viz. by *Cross-strain*, is simply by pressure upon the longest side of a piece of timber, stone, or other material, so as to bend or break it: all beams suffer a portion of cross-strain simply from their own weight; this is vulgarly termed *sagging*; and to counteract the evil effects of this, materials require a previous upward curvature termed a *Camber*.

420. *Gravity* acting by *Cross-strain* upon this *Camber con*-centrates the particles of the materials, and renders them firmer: *Gravity* acting by *Cross-strain* upon materials *not so Cambered, ex*-centrates the particles of the materials, and causes them to break easily.

The *Struts* (sometimes improperly termed *braces*) of an imperfectly-formed roof, enhance the cross-strain upon the tie-beams by punching them in at the points X X.

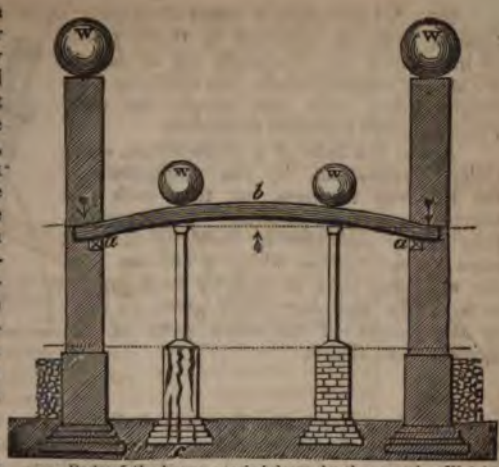


R. R. The Rafters or inclined Principals.
W. W. Weight straining the Rafters or Principals.
T. The Tie-beams.
S. S. The Struts bending down the Tie-beams at X.X. by the Weight communicated to them at W.W.

421. An upward cross-strain is produced against the soffit of a bridge, tank, or drain, by the overflow of water, frequently to such an extent as to blow up the crown of the arched work; and the same effect frequently takes place by the sudden rising of springs under the bottom of an empty tank, which bottom has been laid flat instead of being counter-arched in order to resist the force of springs.

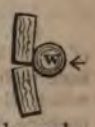
422. Gravity will even sometimes cause an upward cross-strain to the centres of beams, by heavy walls loaded with a roof, sinking the foundation, while light story-posts or columns placed under the beams not having compressed the ground so much as the walls, the ends of the beams borne down by the sinking of the walls, the beams have become bent like immense *cross-bows* or *balistas*, and

have thence sprung up in their middles. The author once knew a large and heavy building which was erected in a few weeks upon a soft foundation; in a short time the great timber girders of it, bent in this manner full six inches, when at length the brick piers upon which the story-posts were set split in ribbons by the force exercised upon them; and shortly afterwards crumbling to atoms, the story-posts themselves were shot away down into the basement-story, and the beams were relieved from their unnatural flexure. This case is however rare, for story-posts and columns most frequently sink more than the walls, from the concentration of much weight upon small spots of ground.



a. a. Ends of the beams carried down by the superior Weight (W.W.) and sinking of the lateral walls.
b. Centres of the beams sprung upwards by the ends *a a* of them descending, the story-posts or columns forming fulcrums for the leverage, through being less depressed by the minor gravity or forces w. w.
c. Pier of brickwork crushed and split by the combined forces W. w. and the spring of the beam.

423. Cross-strain operates horizontally against the wall of a building when a horizontal strut is placed against it (without a counter-strut) to restrain the bulging or prevent the fall of another building: the same effect is occasioned by a vault expanding against the middle of a wall: a like effect is caused to the outer face-work or ashlaring of a wall by the rolling downwards and consequent bulging of internal rubble-work: the same injurious cross-strain, produced by the irregular settlement and bulging of brickwork, occasions slight window-jambs, door-jambs, and pilasters of stone, to snap across their bodies. Cross-strain operates obliquely upon a principal-rafter by a purlin being set upon it without a strut beneath it in order to prevent deflexure.



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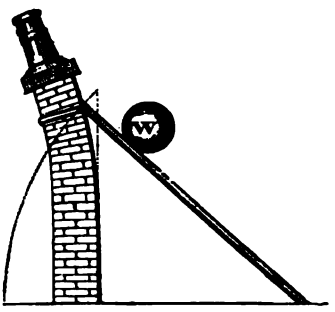
424. The third mode wherein materials are affected by gravity, viz., by *Tension*, in general causes less injury to buildings than either of the other operations of weight; for in general TENSION is not suffered by any of the materials in a building except such as are well able to bear it: simple direct Tension is here intended; for indirect tension will mostly be found to be cross-strain. All Tie-beams of roofs, suffer horizontal tension by the outward sliding upon them of the Principal-rafters; all king-posts (*suspenders*) and queen-posts, (*suspenders*) receive vertical tension by the suspension to them of the Tie-beams, ceilings, &c.; but while gravity, comparatively rarely does injury to materials by direct tension, very frequently injuries occur to buildings, by ties and suspenders not being so disposed as to receive direct tension by gravity, but to be borne down and inflected by it, and thus cease to operate in the direction intended: this is in effect as bad as gravity straightening crooked ties. See § 404.

425. A very common effect of gravity, upon materials intended to act by tension, is to be observed in those pieces of iron which are frequently set as *ravingties* against chimney-shafts, but which by their weight drive over and cripple the work which they are intended to restrain.



Again, the links of a chain-bridge, suffer violent cross-strain, by the suspension of the Roadway to them, but then each link which receives cross-strain, most successfully resists deflexure in itself, by the still more violent tension which it endures from the adjoining links, as well by their gravity as from the straining power given to them by the weight of the other parts of the Roadway and chains.

426. In general, the Practical Builder (most usually a carpenter) evinces very great sagacity in the use of mere temporary shores and struts, while buildings are being under-pinned, repaired, or altered; but it is strange, that the same person who exhibits this sagacity, and who finds out pretty correctly which way the force of gravity will move during the temporary jeopardy of old buildings, should so entirely neglect the means requisite for preventing that extensive derangement which leaves most of our new buildings, intended to be permanent, mere masses of permanent ruins, warped, cracked, distorted, overhanging.

427. Now the Mid-eval Christian Builders arrived (probably from the use of a multitude of small jointed models) to such a delicate and intimate acquaintance with ARCHITECTURAL DYNAMICS, that by the discovery of the way in which all the particles of their materials were affected by gravity, they were enabled, by merely subjecting them to the frangibility caused by compression, so to economize them and reduce their quantity, that many members of Gothic edifices, after five hundred years' devastation by time, are more sound than corresponding members of our modern buildings which have not subsisted fifty years, and which contain five times their proportion of materials.

It was this scientific economy, which enabled those real magicians to rear up securely their works so high towards heaven in the beauty of architectural holiness; it was this scientific economy, which left them money enough, to cover their sweet fabrics within and without, with the richest intaglio, and the goldsmith's work of heaven, while their patrons grumbled not, nor grudged the rich profusion, but joined heart and soul in the goodly work, and the wise and noble fabricator needed none of that kind of over-persuasion, or cajolery, or intentional misunderstanding, or tasteful outwitting, by which alone the modern architect, is frequently enabled to wring from his employer other than bare walls; this scientific economy, rendered unnecessary the rabble of cement-makers and sand-concreters,—those spendthrift empirics, which suck out the brains of architecture, rifle her pockets, violate her chastity, bruise her face to a mummy, and then cover it with oil-plasters and cosmetics of whitewash and iron oxide.

428. So admirable in general is the skill displayed in the Dynamic disposition of the material of a Gothic Cathedral, so shrewdly are the forces of its gravitation reduced to simple compression, that the whole is like a wonderful piece of shoring sublimely and permanently imitated in stone. He who compares its

flying-buttresses to a piece of wood scaffolding, at once confesses that it is raised with that art which emanates from the workman's most delicate and anxious caution *.

CHAPTER L.

On the Mechanical Trussing of Buildings.

430. On the subject of the *Mechanical Trussing* of the roofs, floors, and quartered-partitions of buildings, it is to be lamented, that the public is not sufficiently acquainted, with this beautiful, simple, yet highly scientific principle ; to the neglect of which, are owing so many of the failures in buildings. The whole principle, which can be understood in a few minutes, by the most ordinary capacity, if properly explained, ought to be really understood, by the meanest artificers employed about a building, and not only understood, but *every one connected with building, ought to be so indued with the fear of forgetting the principle, as on no proper occasion to dispense with it.*

431. Every gentleman, every proprietor of buildings, throughout the whole world, ought to understand, the beautiful, the powerful, the economical principle, of Trusses ; and then his property would not be trifled with as at present by the foolish ; and such millions of crazy buildings would not be erected.

432. Those who are not familiar with the principle of Trussing, are to be advertised, that in the roofs, the floors, and the timber partitions of a building, horizontal beams and ties are required, sometimes 60 feet long, or more : these would by their own weight, sink down in the middle, and by their bending either draw in the walls, or be themselves drawn from the walls quite into the building ; and if these beams or ties, be omitted from roofs, then the inclined rafters or beams sinking at their heads by their own weight and that of the covering of the building, will thrust out and overturn the walls.

433. The reader, will remember that passage in the Iliad, where Ulysses and Ajax are described as wrestling, which is translated by Pope, thus :—

* 429. Somewhere in his readings the author has seen it beautifully observed, that the flying-buttresses of Gothic buildings are disposed with such an intimate acquaintance with the laws of force, in order to counteract the pressure of the vaulting, that they resemble in their play and positions, the legs of rampant animals, which are bent so as to support best their ascending bodies : but he has in vain looked for this passage in those books where he supposed that he might have met with it.

"Amid the ring each nervous rival stands,
"Embracing rigid with implicit hands:
"Close lock'd above, their heads and arms are mixt;
"Below, their planted feet, at distance fixt:
"Like two strong rafters which the builder forms,
"Roof to the wintry wind and howling storms,
"Their tops connected, but at wider space
"Fixt on the centre stands their solid base."—*Book 23rd.*

434. The two classical wrestlers represent the rafters of a Building striving by reason of their own weight, and that weight which they have to bear: if the wrestlers, instead of being upon a firm soil, were upon a loose rolling sand, they would fall: so will the rafters of a building, if not confined by either tie-beams, or by the immense strength of the walling. Now suppose these wrestlers instead of wrestling upon the ground were wrestling upon a strong beam, and you will in effect have a Mechanical Truss: but suppose a mere weak plank which could droop down in the middle, employed for the sake of economy, instead of a beam; then imagine a cord attached to the heads of the wrestlers and brought down under the weak plank, so as to hang it up in the middle, and you will have a complete idea of a Mechanical Truss, as actually used.

In an actual Truss you must however imagine the feet of the wrestlers bolted to the horizontal plank, to prevent them from slipping from their footing; and the plank must be placed edge-wise, so as not to bend down by its own weight; and in order still further to economise material, and to render the weight of the Truss less burthensome to the walls of the building upon which it is placed, you may imagine the wrestlers greatly attenuated, but for fear they should sink in their loins through weakness, a diagonal timber, technically called a strut, is carried from near the foot of the suspender up to each wrestling rafter, and thereby prevents it from sinking: *the strut must not be carried down to the horizontal beam, instead of to the foot of this suspender, as many ignorant persons carry it; for it would then tend to distress and sink the Tie-beam, and to separate it from the suspender.* The whole system

P. P. Principals.
T. T. Tie-beam preventing the Principals from expanding.
K. Suspender hung to the heads of the Principals, holding up the Tie-beam in its centre, and improperly termed a King-*post*, but more correctly termed a King-*stirrup*.
St. St. Struts abutting upon the King-stirrup, and preventing the Principals from bending inwards by their own weight and weakness, and by the burthen which the *Truss* may have to bear.

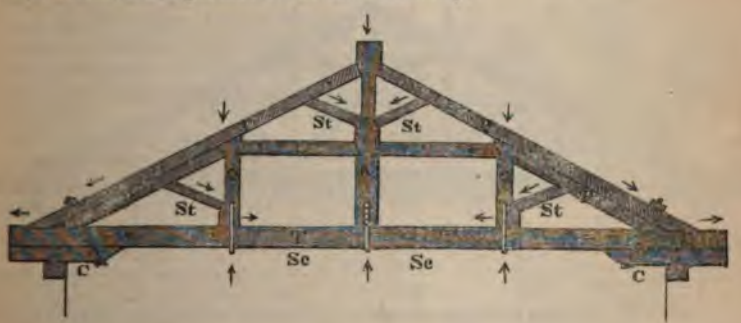
of Mechanical Trussing in buildings, however applied, is a modification of this principle. They who could be brought to understand this, would never allow their buildings or their houses, to be trifled with by the neglect of it.

R. R. The Rafters or Inclined Principals.
W. W. Weight straining the Rafters or Principals.
T. The Tie-beam.
S. S. The Struts bending down the Tie-beam at x. x. by the Weight communicated to them from W. W.

435. When a Truss becomes of more considerable length, it is customary to suspend the Tie-beam of it in *two* places by *two* pieces of material called improperly Queen-*posts*, but which should with more propriety be termed Queen-*suspenders*, or Queen-*stirrups*. This description of Trusses is like a Truss with a King-post separated into two halves, and with a horizontal strut placed betwen the heads of the two halves of the King-post, in order to prevent the inclined beams or *Principals* from being pressed together: this horizontal Strut is termed a *Collar*-beam, *Hammer*-beam, or *Straining*-beam; and sometimes a smaller Collar-beam termed a Straining-*sill*, is placed upon the Tie-beam, between the feet of the Queen-*stirrups*.

P. P. Principals.
T. Tie-beam.
Q. Q. Queen-*stirrups* hung to the heads of the Principals, and suspending the Tie-beam in two places.
St. St. Struts abutting upon the feet of the Queen-stirrups, and supporting the Principals.
C. *Collar*-beam, *Hammer*-beam, or *Straining*-beam.

436. Increasing the number of suspenders to the Tie-beams, renders smaller and weaker timbers sufficiently stiff for the purpose of tie: and the *Principals* being also shortened partake of the same economy.



P. P. P. P. Principals.
T. T. Tie-beam.
K. King-*stirrup* hung to the heads of the *upper* Principals, and sustaining the Tie-beam in its centre.
Q. Q. Queen-*stirrups* hung to the heads of the *lower* Principals, and sustaining the Tie-beam between its centre and its ends. The *upper* Principals may also be made to support more of the burthen by passing round them iron straps from the heads of the Queen-

stirrups, in which case two additional struts may be carried from the foot of the King-stirrup to the heads of the Queen-stirrups.

St. St. St. St. Struts abutting upon the King-*stirrup* and Queen-*stirrups*, and supporting the upper and lower Principals.

C. C. *Collar*-beams between the King-*stirrup* and Queen-*stirrups*.

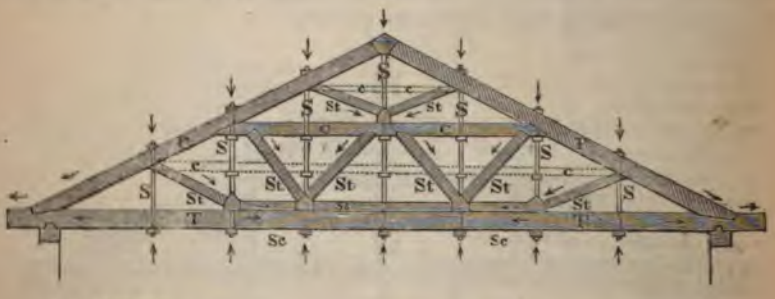
c. c. Corbeilles of oak to strengthen the ends of the Tie-beam where all the weight and action of the Truss are concentrated.

Sc.——Sc. The part of the Tie-beam in which the timber may be scarfed, the counter-direction of the lower struts there pressing the parts of the Tie-beam together, while at the other parts of the Tie-beam the Principals and the Struts acting in opposite directions strain asunder the parts of the Tie-beam.

437. Sometimes *three suspenders* are obtained to the Tie-beam, by forming a Queen-truss within a King-truss, as here shewn; and this kind of framing will answer properly for a roof 60 feet or 80 feet span. Sometimes instead of one King-*post*, this description of Truss has two boards hung to the heads of the upper Principals, and extending down to the Tie-beam: in this case the Collar-beam is in one piece, and passes between the two boards. There is yet another method of managing this King-post as practised more than 400 years ago, at the Basilica of St. Paul at Rome. This was by splitting as it were the whole Truss longitudinally into two separate lighter or half Trusses, and then keying the King-post between these two separate Trusses, so as to form one mass. Suspenders of iron obviate this reduplication of the Trusses. If it be determined to split each Truss into two, it will be best then to place them only half as far apart as they would otherwise have been, and thus reduce the bearing, bulk, and burthen of the Purlins, and hold in the Walls at twice the ordinary number of places and perform all this with a smaller quantity of material.

438. The points of suspension may in this last description of Truss be still further increased to *seven* in number, by screwing through the Tie-beam *four* intermediate *Queen-bolts* of wrought-iron hung to the backs of the Principals.

439. The last-mentioned kind of Truss may be simplified, by using only *two* Principals instead of four of them, and by making all the suspenders of wrought-iron. Indeed there is no limit to the number of suspenders which may be used in this system of framing; the more these are in number, the lighter may be all the parts of the Truss except the two inclined beams or Principals, which can only be lightened in proportion to the burthen which they have to carry. The



P. P. Principals.

T. T. Tie-beam.

S. S. S. S. S S. S Suspenders of wrought-iron hung to the backs of the Principals, and holding up the Tie-beam.

St. St. St. St. St. St. St. St Struts abutting upon the Suspenders, and directed exactly to those points of the Principals which receive the cross-strain of the Suspenders and the burthen which they have to carry.

C. C. Collar-beam.

cc. cc. Other Collar-beams which may be framed in short pieces between the Struts, but which will become loose by the shrinkage of the Struts, and will then require re-adjustment.

Ss. Straining-sill.

Sc.——Sc. Parts of the Tie-beam between which the timber may be scarfed.

span of this kind of Truss, is only limited by the length of timber which can be obtained for the Principals : 95 feet is the greatest length of fir timber which the author remembers to have seen in England, so that 150 feet or 160 feet is perhaps the utmost span to which this Truss can be carried without scarfing the Principals, which is unadvisable, as the more there are of such joints the greater will be the settlement of the framing.

440. All timber Trusses are subject to very considerable downward settlement from their weight, from the natural flexibility of the timber, and from the shrinkage of it by drying ; in order to counteract the effect of this settlement, it is usual, to form at first the tie-beams of Trusses with an upward curvature called a camber, so that after the unavoidable settlement has occurred, the tie-beams, with the ceiling or whatever else may be attached to them, may not droop down. But it must be observed, that the deflexure of the tie-beams of Trusses is increased by the reprehensible practice of framing the king-posts and queen-posts at first close into the tie-beams, by which practice, the slightest depression of the Principals by settlement, causes the king-posts and queen-posts to punch in immediately the tie-beams, and thus to cause them to sink ; whereas, if the king-posts and queen-posts be only attached loosely to the tie-beams by stirrups of iron, as is the case in the roof of the Theatre d'Argentina at Rome, and as was also the case in some of the Trusses of the Basilica of St. Paul at Rome, all deflexure of the tie-beams may at any time be corrected by wedges or by screws, and thus a ceiling the most sunken may be restored to its original level.

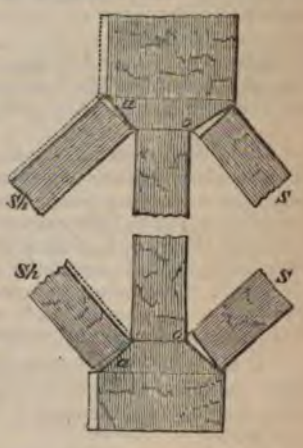
The ordinary mode of forcing up a tie-beam to an excessive camber, is very ignorant and reprehensible ; for the tie-beam then not only by its own weight but also by its natural spring, endeavours to recover its natural state of rest ; and thus the Principals become the more readily deflected and deranged : to draw up the tie-beam by screws or wedges, only after it is deflected, is to leave the Principals free from all strain, except that caused by gravity.

441. In framing the Principals and Struts into king-posts and queen-posts of ordinary unseasoned timber, it will be well to leave the diagonal joints at first open, as shewn in the adjoining wood cut, at the letters *o*, *o*, so that when the broad heads and feet of the king-posts and queen-posts have completely shrunk and rendered the abutments more steep, the Principals and Struts may fit closely, as shewn at the letters *a*, *a*. See § 338.

442. It should be a general maxim with the architect, never to leave exposed to the weather, members of buildings so important as Trusses, whether of timber or of iron : if of timber they may rot, and the fabric may thus become endangered ; and if of iron, decomposition will take place, and every thing around them be tainted with rust.

443. Dr. Robison makes with regard to the Trusses of roofs, the following excellent remarks :—

" Nothing shews the skill of a carpenter



S. S. A Principal and a Strut framed with open abutments into a King post or Suspender of new timber.

o. o. Open crevices left at first in the framing.

Sh. Sh. A Principal and a Strut originally framed with open abutments, but afterwards fitting closely by the shrinkage of the timber altering the abutments *a*, *a*, to the requisite steepness.

" more than the distinctness with which he can foresee the changes of shape " which must take place in a short time in every roof. A knowledge of this will " often correct a construction which the mere mathematician thinks unexception- " able, because he does not reckon on the actual compression which must obtain, " and imagines that his triangles, which sustain no cross-strain, invariably retain " their shape till the pieces break. The sagacity of the experienced carpenter is " not, however, enough, without science for perfecting the art. But when he " knows how much a particular piece will yield to compression in one case, sci- " ence will tell him, and nothing but science can do it, what will be the com- " pression of the same piece in another very different case. Thus he learns how " far it will now yield, and then he proportions the parts so to each other, that " when all have yielded according to their strains, the whole is of the shape he " wished to produce, and every point is in a state of firmness. It is here that we " observe the greatest number of improprieties. The iron straps are frequently " in positions not suited to the actual strain on them, and they are in a state of " violent twist, which both tends strongly to break the strap, and to cripple the " pieces which they surround."—*System of Mechanical Philosophy*. Sir David Brewster's edition, Edinburgh, A.D. 1822. vol. I. p. 60. § 576.

444. There are two observations more to be made concerning Mechanical Trusses : the first with regard to *Struts*, and the second with regard to the *Feet* of Principals.

With regard to Struts, it seems to be rather extensively imagined that they are as much placed according to some vain ideas of symmetry, or of particular inclination, as for any useful purpose ; whereas it should never be forgotten, that their only use is to prevent weak Principals from being deflected by purlins or other burthens : therefore Struts in Trusses should be as numerous as, but for those Struts, would be the deflected parts of the Principals ; and they should be most exactly directed to the points of the Principals which but for them would be deflected : thus it may happen, that two or even three Struts may emanate from the foot of one king-post or queen-post, and counteract the pressure upon the Principal from as many purlins.

445. With regard to the feet of Principals, it is to be observed, that many of our modern Trusses are exceedingly faulty, from the feet of the Principals being cast a long way within the walls, and thus bending the ends of the Tie-beams, so as also to bend and crack the ceilings : the thinness of most modern walls, and the lowness of the pitch of some modern roofs, cause this defect to be the greater, and it is sometimes still further increased by a heavy pole-plate with the weight of the rafters and covering of the roof upon it, being set injudiciously *within* the walls, upon the ends of the Tie-beams. Even some roofs of modern churches, have speedily required the correction of this defect.

If the rafters be set *horizontally* as small purlins upon the backs of the Principals, the strain of the Principals may be set in ordinary cases almost upon the walls, and thus save the ends of the Tie-beams from the improper cross-strain.

446. From the train of evils, resulting to edifices from not being properly trussed, it appears upon the most moderate calculation, that a sum of not less than five millions of pounds sterling is annually expended within the British dominion alone, in the mere repairs consequent upon such malformation : that is to say, at least £5,000,000. annually change hands for an useless and dishonourable purpose, still leaving floors out of level and walls thrust over ; whereas so vast a sum expended well, would restore to architecture, solidity, intrinsic nature, carving, loftiness, and every adornment which the most noble-minded or even the most princely could desire, and would banish all the base and lazy stinting in our modern church architecture, while our private buildings remain-

ing unwarped and unsunken, would need but few repairs, and those of but small expense.

447. The history of the Mechanical trussing of Buildings is a most interesting subject, which is unfortunately involved in great obscurity: probably with organs, and many national and sacred melodies, the history of which reaches beyond record, Trusses may be derived from high antiquity.

The author abstains from giving any new principles with regard to the strength of the component parts of Trusses; he recommends to the particular notice of the man who intends to become a Real and Practical Architect, the fine Works of Krafft and Tredgold. See § 172, and § 242 *.

448. It must always be remembered, that when Trusses are used, a vast weight is concentrated upon each end of them: great care must therefore be taken, to support well their ends; and if they be inserted in walls, the weight should be diffused over as large and as firm a surface as possible, by strong plates or templets of stone, iron, or wood: but no truss of wood should be set upon supports of stone absorbent of moisture, without the interposition of plates of lead, iron, or other metal, in order to prevent the wood from rotting.

CHAPTER LI.

Of that Change, which Takes Place in all Buildings, Simply from the Effect of Gravity; and of the Prevention of that Effect, which would be Fatal if not Guarded against.

449. The several mechanical and mathematical theories, upon which a Building may be constructed, may be perfect; but so difficult is the practical application of such theories in simple perfection, that failure, more or less considerable, takes place in all Buildings, merely from the gravity of their materials: to prevent disastrous effects, it therefore becomes necessary, to make such allowances in construction, *that after the materials have subsided by their own weight, the form of the work shall exhibit no giving way*, and that *the construction shall still bear a considerable increase of weight, without being impaired:* thus forethought is enabled to enslave gravity and time, and to compel them by their efforts, to render a work more true and consolidated; while without this forethought, their efforts would bring destruction.

450. Thus every beam, falling down or sagging by its own natural weight, requires to be something cambered, bent, or arched upwardly, otherwise it will soon be found to bend downwardly constantly more and more. Almost every great arch, should be formed something depressed at its haunches, so that when the natural derangement of its parts takes place from gravity, after its centering is removed, it may fall as nearly as possible into a proper shape.

451. The piers of most arched openings, should be something closer together at top than at bottom, otherwise it will be soon found, that the arch has thrust them apart, so as to make the work appear ruinous; and even though they

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* The author is preparing an extensive set of models of various descriptions of Trusses, by which he expects to arrive at greater certainty in the requisite strength and adjustment of Trusses: many of these models will be formed with exactly the same quantity of material, so as to ascertain their relative strength, and the most profitable application of materials; there will be several examples of each model, so as to arrive at a fair average of strength; and he proposes to break all these models before a party of his friends, marking the weights which they severally bear in different states of derangement.

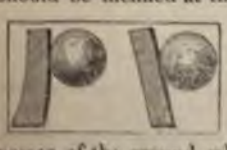
be perpendicular, they will not appear so; besides, if the piers incline something together, they will both appear better, and will counteract the thrust of the arch.

452. Well acquainted with this principle, the Romans, though they very considerably debased much of their decorative architecture, till almost the decease of their nation as well as of art, scarcely ever threw arches from upwardly diminishing columns:—columns so ill-treated, have in most cases a ruinous and falling appearance; and if arches be turned over *Grecian* columns, the violation of art as well as of perspective, is still more apparent: hence the Gothic architects, whose knowledge of optical perspective, and whose practical skill, exhibit almost the ripened thought of myriads of years, never diminished upwardly their piers and columns, beneath their arches.

453. The ancients, knowing how much more secure were their fabrics when made to settle together and consolidate by their own gravity, set the lateral columns of their temples with their axes falling towards the cells, so that the inner faces of the shafts of the columns should be perpendicular, and the outer faces of them receding the whole quantity of columnar diminution, in order to afford to the Building a more solid pyramidal and graceful appearance: (see Vitruvius, book iii. cap. 3.—Palladio, "Del Tempio di Vesta," book iv. cap. 23.—Taylor and Cresy's Architectural Antiquities of Rome, vol. 2. page 6.) and by this shrewd device they rendered the avenues between the side walls and the colonnades of their Temples, no wider next the soffits of the architraves than down upon the pavement; and it is not improbable that the preservation of this symmetry led to the omission of the inner columns of the ancient Pseudo-dipteral Temples; whereas the moderns, in general, not attending to this dynamic and optical nicety in architecture, so set their columns that when we walk down a modern colonnade, we cannot divest ourselves of the idea that the axes of all the columns are falling outwards: and indeed accurate admeasurement would often find this to be no illusion, since the work not erected so as to fall together, will in general with the slightest inevitable settlement expand at its upper part. This defect is peculiarly visible in most of our modern church turrets, which being derived in their general form, from the pyramidal towers and spires of Pointed Architecture, the eye and the mind naturally expect them to diminish upwardly; whereas partly from settlement, and partly from optical illusion caused by the projection of their cornices, and the downward diminution of their inter-columniations, they appear to diminish downwardly,—and therefore possess none of the picturesque effect without which such ornamental structures are useless.

This is one more proof of the decline of architecture at the present age in which science and architectural integrity have given place to petty quarrels,—an age in which the pert and shallow trifler instead of employing his precious time in searching into the noble depths of his art, wastes it perhaps in first proving that Vitruvius was an impostor, and then that he never lived and was therefore no impostor.

454. Again, if there be any moving power acting against a wall, the work should be inclined at the top, towards that moving power, so as to oppose the gravity of the wall to that moving power; for if this precaution be not taken, the wall will speedily be thrust out of perpendicular into a falling state, and its own gravity will be added to the moving power: on this principle, all canal and embankment walls are built falling in a curvilinear form, against the moving power of the ground, which they are intended to restrain.



455. Again, if there be any other force acting against the Building, from

accidental or other circumstances, this must be opposed: thus, if there be an overhanging party-wall, which from some difficulties it is not convenient to pull down, this acting against a new corner-house would in the end drive the new Building dangerously out of the perpendicular: but if the new walls be made to incline pyramidally towards the overhanging party-wall, no alteration or fracture will take place in the new work, from the circumstance in question.

456. Some years ago, the author was ordered to rebuild a corner-house four stories high, one of the party-walls to which overhung 12 inches: the delay and expense which would have ensued from condemning the party-wall in question, not suiting the views of the proprietor, the new house was erected with its external walling inclined inwardly 3 inches; this artifice could not be perceived; and up to this time, no alteration has taken place in the position of the walls of the house.

457. If any one through the plea of optical nicety, object to the external walls of a Building being made to fall something backwardly, it would be still better for him to entertain the same scruples towards their *jetting forward*, without which very few Buildings exist immediately after they have settled to their ultimate bearing.

458. The following excellent observations upon this subject are to be found in "*Architecture Pratique*," by P. Bullet; Paris, A.D. 1691. p. 86. (See § 104.)

"Les murs de faces des maisons que l'on veut faire solides, doivent avoir "au moins deux pieds d'épaisseur par bas, sur la retraite des premieres assises; on "leur donne quelquefois moins d'épaisseur pour épargner la dépense, mais ils "n'en sont pas si bons; il faut qu'un mur ait une épaisseur proportionée à la "portée qu'il a; *il est nécessaire de donner un peu de talus, ou fruit par dehors en "élevant les murs; ce fruit doit estre au moins de 3 lignes par toise.* Il faut outre "cela faire une retraite par dehors sur chaque plinthe, d'un pouce pour chaque "étage, en sorte qu'un mur qui aura deux pieds par bas sur la retraite, s'il a trois "étages qui fassent ensemble par exemple 7 toises, il se trouvera à peu prés 20 "pouces sous l'entablement; car il faut que les murs de face soient élevez à "plomb par dedans œuvre; il y en a mesme qui leur donnent un peu de sur-"plomb, & qui laissent des retraites à proportion en dedans sur les planchers."

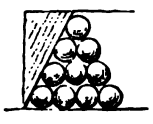
459. And in the work last quoted are contained the following observations relative to Rampart-walls or Revêtements, which, as containing the earliest minute search into the subject, are the more curious and valuable.

"La troisième chose qu'il faut observer pour la construction des murs de "rempart & de terrasse, est de sçavoir leur donner une épaisseur convenable & "proportionnée à la hauteur des terres qu'ils ont à soûtenir. Il est vray que la "bonne construction doit faire partie de la résistance; mais outre cela il faut "avoir une principe pour en regler l'épaisseur. Cette regle n'a point encore esté "donnée par aucun de ceux qui ont écrit de l'Architecture tant civile que "militaire, quoyque ce soit une chose de tres-grande consequence; l'on a laissé "cela à la prudence de ceux qui ont la conduite des ouvrages, lesquels reglent "souvent l'épaisseur des murs qu'ils ont à faire, par rapport à ceux qu'ils ont "veu faire, ou qu'ils ont faits, & selon les lieux & la qualité des materiaux qu'ils y "employent; les plus sages leur donnent toûjours plus que moins d'épaisseur, "afin de prévenir les inconveniens qui en peuvent arriver; mais l'on n'a point "encore que je sçache decidé leur épaisseur: en voicy un essay dont je me suis "avisé, qui est fondé sur les principes de Mechanique.

"Il est certain que la terre la plus coulante est le sable, parce qu'estant "composé de petits caillous ronds tous desunis, ils tendent à descendre dans les "parties basses, quand il y a la moindre disposition, à cause que leur figure qui "est ronde, est la plus disposée au mouvement; mais comme cette inclinaison

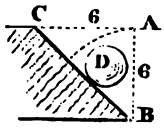
" peut estre mesurée, l'on peut sçavoir jusques à quel angle la terre sablonneuse " peut tomber.

" Si on considere les grains de sable comme autant de petits caillous ronds, " arrangez en sorte qu'ils se touchent par les costez, & qu'estant posez les uns sur " les autres dans une disposition naturelle, c'est-à-dire que le milieu des boules " d'un rang superieur, soit toûjours posé sur le milieu des deux de l'inferieur. Dans " cette disposition l'on trouvera que l'angle que ces boules formeront par rapport " à leurs bases de niveau, sera les trois quarts" (this has been altered by the pen " to $\frac{2}{3}$) " d'un angle droit, c'est-à-dire de 60 degrez. Il semble que



" la terre sablonneuse ne devroit point passer cet angle, mais " l'experience fait connoistre que le sable prend une pente plus " inclinée ; & pour tenir sur cela le chemin le plus seur, je sup- " pose que cet angle soit un demi-droit, c'est-à-dire qu'il soit " comme la diagonale d'un quarré, en sorte que si une terre " étant coupée à plomb comme A B, elle soit arrêtée par un corps qui la soûti- " enne, comme un mur ou autre chose, & que ce corps puisse estre retiré tout " d'un coup, la terre en tombant formera la diagonale d'un quarré comme B C ; " ce qui étant supposé pour la plus grande inclinaison de l'écoulement des terres, " il reste à connoistre quel soûtien il faut pour arrêter la poussée du triangle " C A B, qui est une figure de coin, & l'on peut expliquer cette poussée par le " plan incliné en cette manière.

" Il est démontré dans les principes de la Statique, qu'un plan étant incliné " comme C B, qui peut estre une table ou un autre corps uni sur lequel on veut " faire tenir une boule comme D, il faut pour tenir cette boule sur le corps in-



" cliné, une force ou puissance qui soit au poids de la boule " comme la hauteur B A est au plan incliné C B, ou comme " le costé est à la diagonale d'un quarré ; & quoyque cette " proposition soit incommensurable en nombre l'on peut nean- " moins en approcher, elle est à peu prés comme 5 est à 7. " Il faut donc que la resistance du mur, qui sera fait pour " arrêter les terres du coin C B A, soit au même coin, " comme 5 est à 7. Pour resoudre cette question, il faut mesurer la superficie du " triangle A B C, & pour cela je suppose que chacun de ses costez A B, A C, " ait 6 toises, le triangle aura 18 toises en superficie ; il est question de trouver " un nombre à qui 18 soit comme 7 est à 5, qui sera un peu moins que 13 : il " faut donc que le profil du mur qui doit arrêter les terres, ait 13 toises en super- " ficie ; ainsi ce mur opposera une force égale à la poussée des terres par son " poids, quand la maçonnerie ne peseroit en pareil volume que la pesanteur des " terres.

" Cela estant supposé, dans la figure que l'on doit faire de ce profil, il faut " sçavoir combien on veut donner de talus au mur. Si c'est un mur de rempart, " on luy donne ordinairement un sixiéme de sa hauteur ; comme si le mur A B " a six toises de hauteur, on luy donne une toise de talus de A en C, cela va à " deux pouces par pied. Cette inclinaison C B fait avec la ligne àplomb A B

" un angle de 9 degrez, 27 minutes, 45 secondes. Et pour sçavoir par " cette règle l'épaisseur par le bas d'un mur qui a 6 toises de hauteur, " il faut reduire en pieds superficiels tout le triangle des terres, qui a " 18 toises en superficie, ce que l'on aura en multipliant 18 par 36 : il " viendra 648 pour le profil du triangle supposé ; il faut ensuit trouver " un nombre à qui 648 soit comme 13 est à 18, ce qui se peut faire par " une règle de proportion en mettant au premier terme 13, au deuxiéme 18, & " au troisieme 648, & il viendra 468 pour la superficie du profil du mur : lesquels " 468 il faut diviser par 36 pieds de la hauteur dudit mur, & l'on aura 13 pieds " pour son epaisseur, s'il estoit àplomb ; mais comme il a 6 pieds de talus, il les " faut diviser en deux, & ajoûter trois pieds aux 13 pieds, & cela fera 16 pieds " pour l'épaisseur du mur par le bas, & 10 pieds par le haut, en sorte que toute " la hauteur du mur qui est 36 pieds sera à son épaisseur par le pied, comme 36

" est à 16, & à son épaisseur par le haut, comme 36 est à 10, & le profil du mur " sera au profil du triangle des terres, comme 13 est à 18, ainsi qu'il a esté " supposé.

" Comme cette règle peut servir pour sçavoir l'épaisseur que doivent avoir " les murs de rempart par rapport à la hauteur des terres qu'ils ont à soûtenir, " l'on peut reduire cette proportion aux moindres termes, en prenant la moitié de " 36, qui est 18, & la moitié de 16, qui est 8, pour l'épaisseur d'un mur par le bas ; " & si l'on suit le mesme talus, il faudra donner 5 par le haut : car 18, 8, & 5, sont " entr'eux, comme 36, 16, & 10 que j'ay supposez d'abord ; ainsi l'on peut par " cette règle donner les épaisseurs de tous les murs de rempart par rapport à " leur hauteur.

" S'il arrive du changement dans cette hypothese, ce ne peut estre que par " les differens talus que l'on peut donner aux murs de rempart ou de terrasse. " J'ay pris le sixième pour les murs de rempart, je crois que le cinquiéme seroit " trop, il faut que ce soit la prudence qui decide de cela.

" Pour les murs de terrasse, quand ils n'ont pas grande hauteur, comme " jusques à 12 pieds, on peut leur donner un neuviéme de talus ; & quand ils n'ont " que six pieds de haut, c'est assez d'un douziéme, supposé que la construction " soit bonne ; mais depuis 12 jusques à 15 ou 20 pieds de haut, on leur donne " un huitiéme, & ainsi du rest à proportion.

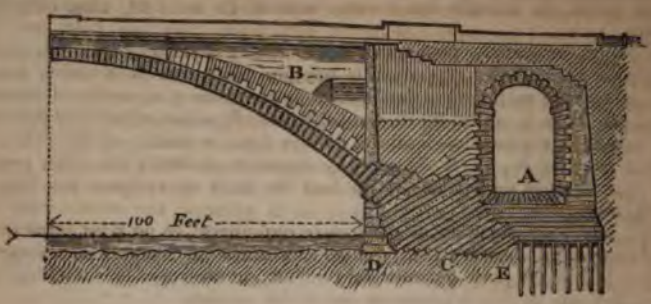
" Il n'est pas difficile de reduire le profil des autres murs par la mesme règle " suivant les différens talus qu'on voudra leur donner ; car à un mur qui n'aura, " par exemple, que 20 pieds de haut, & auquel on ne donnera que $\frac{1}{6}$ de talus, le " huitiéme de 20 est 2 pieds $\frac{1}{2}$, c'est-à-dire que le mur proposé qui aura 20 pieds " de haut n'aura que 2 pi. $\frac{1}{2}$ de talus, le triangle de terre auderriere d'un mur " qui a 20 pieds de haut, aura 200 pieds de profil, il faut faire un profil du mur " sur le talus, à qui 200 soit comme 18 est à 13, l'on aura $144\frac{4}{9}$ qu'il faut diviser " par 20, il viendra 7 $\frac{19}{20}$ c'est-à-dire un peu plus de 7 $\frac{1}{3}$, ausquels 7 $\frac{1}{3}$ il faut ajoûter " 1 pied $\frac{1}{4}$, qui est la moitié du talus, & l'on aura 8 pieds $\frac{1}{2}$ ou à fort peu prés " 8 pieds $\frac{1}{2}$ pour l'épaisseur du pied du mur, & 6 pieds pour l'épasseur par le " haut : par ce moyen l'on aura le profil du mur suivant la hauteur & le talus " propose, & ainsi des autres talus à proportion.

" Il y a une chose à observer pour les fondemens des murs de talus, c'est " qu'on éleve ces fondemens presque toûjours à plomb ou peu en talus dans les " terres, & l'on se contente de laisser une retraite au réz de chaussée ; mais il " arrive souvent, que quand le fondement est profond, que la ligne du talus " estant prolongée, porte à faux, & c'est à quoy il faut prendre garde, car cela " est contre la solidité.

" Quand on fait des murs de talus pour des quais sur le bord des rivières où " l'on est obligé de piloter, il faut aussi observer de faire battre des pieux assez " avant sur le devant pour qu'il se trouve du solide sous le prolongement de la " ligne du talus ; & outre ce pilotis, on met un rang de pieux de garde au devant " dudit mur, avec une piece de bois pardessus lesdits pieux, que l'on appelle " chapeau, laquelle piece de bois est entaillée avec mortaises pour entrer dans " des tenons que l'on fait au haut desdits pieux, & outre cela l'on y met de " bonnes chevilles de fer." P. Bullet, p. 170.

460. A perusal of the following quotation from the account of the erection of the Great Bridge at Chester, to be found in the " *Transactions of the Institution of Civil Engineers*" (see § 165.) will shew with what delicacy skill can overcome and direct to its purpose the effects of that gravity which might cause ruin.

" To prevent flushing near the haunches, and rectify any tendency to change " of form in the arch on the removal of the centre, the first course above the " springers was laid upon a wedge of lead 1 $\frac{1}{2}$ inch thick on the face and " running out to nothing at the extremity of the bed, and strips of sheet lead " eight or nine inches wide were also introduced in the joints on each side,



A. Land Arch.
B. Spandril filled in with open masonry, consisting of Gothic arches concealed from view.
C. Abutment upon the solid rock, forming part of the great Arch itself.
D. Face-work of masonry, before the abutment.
E. Wood-piling, rendered necessary at one end of the Bridge, by the abrupt descent of the rock.

" up to where the point of pressure was considered to change its position from " the front to the back of the archstones, or in fact in the present case over " about two-thirds of the whole soffit. This disposition remained unaltered until " the easing of the centre let the whole of the arch settle on the lead, which " from its yielding nature then caused the pressure to be spread evenly over the " whole of the bed of each course, and thereby prevented drafts or openings at " the back of the archstone joints ; the wedge-piece at the springing also acting " by way of adjustment, and counteracting the inclination of the arch in coming " to its bearing when the centre is struck to throw an undue weight on the in- " trados of the springing course. Judging from the soundness of the archstones " throughout, this plan seems to have answered fully the end sought, the weight " having been received so uniformly and gradually on all points, that not the " slightest appearance of *spaulching* or cracking is perceptible in the work of the " great Arch.

" In setting the keystones three thin slips of lead were first hung down on " each of the stones between which they were to be inserted, and the keystone " being then besmeared with a thin greasy putty made of white lead and oil, " was driven down with a small pile engine, the lead acting as a slide and pre- " venting grating until the stone was quite home."—Page 209.

The centering of this Bridge, designed by Mr. Trubshaw, was peculiar. " In the Chester centre each rib is composed of four distinct and independent " parts, and carries the wedges on its outer rim instead of being borne by them, " so that it can be struck gradually, being made tight at one place and slackened " at another, according to the symptoms shown by the arch, as its support is " removed and the stone-work comes to its bearing. Mr. Trubshaw's principle " is, therefore, in a few words, to arrange the timber so as to have the strain all " in a vertical direction, doing away with the necessity of much horizontal tying, " which from its shrinkage he considers apt to derange the framing, and to ease " immediately under the covering instead of under the sill of the centre ; and " with this construction he would strike a centre soon after the Arch was finished, " while the mortar was yet as it were a paste, easing a little at first, and then " giving some time for the joints to accommodate themselves, and so proceeding. " His method of striking is to keep up the crown and let the haunches down ; " and though this has a tendency to press the keystone up, he states that he has " found a greater and more usual difficulty to be in managing an arch after the " key was lowered, as it must be at once and beyond recal with centres of the " usual make.

" The centre was of fir, and with the exception of the parts already men-
" tioned as otherwise, was composed entirely of whole and half timbers ;—pieces
" from 22 to 36 feet long, were not bored with more than one hole, and it of
" small size, so that, the material being sound when taken out, the whole cost to
" the contractor was only about £500, an amount which, even allowing for the
" advantage derived from the accidental circumstance of a quantity of seasoned
" wood being opportunely required for a public work in the neighbourhood, must
" still be considered a very low price for a structure requiring 10,000 cubic feet
" of timber. That the expectations of the projector were fulfilled in other respects
" also, is proved by the circumstance of half the arch being turned before the
" centre was finished, while the fact that on its removal the crown sank only
" from 2½ to 2⅝ inches, the joints remaining perfectly close, and no derangement
" of form being perceptible, attests the skill and care at once of the carpenter
" and the mason."—Page 212.

461. But wisdom in counteracting the deranging effects of gravity was carried to a pitch still higher by the Engineer of the New Bridge at Turin, who so formed his work as not only to counteract the derangement which the effect of gravity produced during the construction of the work, but so as still to leave nearly 3 inches for the crown of the great Arch to sink by any future shock or derangement which the work might receive, and be then exactly of the form of the first design of the Bridge. (See § 165.)

462. " Theory shews, and it has been proved by trial on a small experi-
" mental arch, as well as by observations on the subsidence of arches of limited
" dimensions built by Perronet and other scientific men, that in this kind of
" structure the settling down takes place by the descent of the parts about the
" centre of the arch, and the pressing of the joints of the wedge at the intrados
" near the springs and at the intrados near the keystone, and consequently if
" the general pressure that must ensue on removing the centres, and in the sub-
" sequent settlement is not properly guarded against, it will chip off the edges of
" the voussoirs, and might very probably be followed by accidents of a far more
" serious and fatal nature. The engineer Boistard, to avoid those incon-
" veniences in building the Bridge of Nemours*, which is only 72.30 feet span,
" and 7.20 feet rise, had the wedges or arch-stones cut somewhat smaller than
" they would have been, had the intended segment been divided by the deter-
" mined number of wedges. He supposed that in removing the centres the vous-
" soirs would not come quite close to each other, and directed them to be so
" placed that the intervals between the joints should vary in the direction of the
" intrados according to the terms of a decreasing progression from the spring to
" the key, and consequently in an inverse progression in the direction of the
" extrados."

" But the engineer Mosca, in planning the Bridge over the Dora, supposed,
" and with truth, that on removing the centering, the voussoirs should come
" completely in contact, and consequently he directed them to be cut exactly
" equal to an arch of the span of 147.63836 feet, and a versed sine of 18.04468
" feet, and in the framing of it, as we have already mentioned, an arch was
" adopted for the centering, of the same span, but with a versed sine of 18.9015
" feet, and decreasing proportionally to the springs where it intersects with the
" real segment. He directed also that the joints, instead of being on the projec-
" tion of the radius to the centre of the arch, as is too generally the case, should
" be so placed as to have the faces of contact of those near the springs diverging
" between themselves at the intrados in a decreasing progression proceeding
" from the impost, and of those near the centre diverging at the extrados in a

* " Buzani Antologia di Firenze."

" similar progression proceeding from the key-stone. It is proper to state, that as " the difference between the real arch and that adopted for the centres, was not " of sufficient magnitude to enable the workmen, in so great a number of wedges, " to establish the spaces between the joints according to the calculated progres- " sions, in terms that they could physically appreciate during the erection, the " engineer adopted the practical means of dividing the Arch into three parts, " and directed that in the lower, the joints should diverge near the intrados, that " the voussoirs should be placed parallel in the second, and that in the last or " upper they should diverge towards the extrados.

" During the operations on the platform, the cutting of the arch-stones, " framing the service bridges and centres, with the superstructure of timbers for " lifting and setting the voussoirs, the masonry of the abutments acquired the " necessary consistency, and it was then judged proper to proceed with the con- " struction of the Arch.

" In order to be able to rectify the position of the wedges by means of the " calculated tables, an horizontal beam was placed below the arch in a steady " position, independent of the centres, upon which were marked abscisses ; " and the ordinates of the arch were designated upon two vertical timbers, esta- " blished like the horizontal one, in an independent and steady position near the " abutments.

" The placing of the arch-stones was then begun, and carried on in the " manner before mentioned, and with all necessary precautions ; and besides those " generally employed, the following peculiar process was put in practice.

" The courses at the spring of the arch were first set ; these were con- " nected by crotchets to each other, and to those of the face of the circular sides " of the abutments which rise above the spring of the principal arch of the faces, " viz. up to the twelfth horizontal course ; they were then cut and disposed in " such a manner as to form the required angles at the *ugnature*, and at the meet- " ing of the convex surface of the abutments with the face of the arch. After " each course had been placed with the greatest nicety, their exact positions were " verified by means of the abscisses, and the corresponding ordinates marked out " on the horizontal and perpendicular timbers, and the inclination of each was " properly ascertained. The next proceeding was to place the remaining courses " of wedges ; and in order to obtain with the greatest exactness the divergence " of the joints between each voussoir, and to hold them in their required posi- " tions till the lowering of the centres, small plates of lead of a thickness deter- " mined by the terms of the fixed progressions were placed between those " towards the impost at the intrados, and those towards the key-stone at the " extrados, and the exact position of each was verified by means of the practical " method established for finding the ordinates. With respect to those voussoirs " forming the centre part of the arch, they being somewhat smaller than those of " the faces, and of various lengths, small iron wedges were introduced between " the joints to hold them in their desired diverging positions, instead of the " leaden ones. The work of setting the arch-stones being completed with the " prescribed accuracy, and the final position of each voussoir being progressively " rectified according to the detailed directions, the intervals left between the " wedges were filled with a moderately liquid cement of lime and clean sand, " mixed in equal parts, which was retained by a slight stuffing of tow, introduced " at the lowest part of the aperture of each joint ; the iron wedges were then " taken away, and in order to ascertain the depression which would take place " in the arch on removing the centres, another ingenious yet very simple and " precise method was adopted.

" A horizontal line was drawn over the total length of each face of the " arch, forming a tangent at the intrados of the key-stone, and on each side of " the key-stone an oblique line was drawn, starting from a common point at the " centre, and tangential to the faces of the exterior arch forming the *ugnature*.

" By means of these three lines drawn on each face of the arch, the least " motion of the wedges, or voussoirs, would have been observed and determined, " upon referring them to the established points of level near the impost of the " Arch.

" Besides all these precautions, the engineer, before removing the centres, " directed that the cement should be scraped off all the joints of the arch-stones " at the extrados, as well as at the intrados, to the depth of three centimetres, to " prevent, in the settling of the Arch, any chipping off the angles of the faces " of the voussoirs: these spaces were again filled at the conclusion of the " work.

" All these operations being completed, and twenty days having elapsed from " that on which the arch had been keyed, the lowering of the centres was begun. " On removing the cheek pieces, the 240 wedges supporting the centres com- " menced with an almost simultaneous movement gliding down uniformly and " insensibly, by the effects of the gravity of the arch-stones and centres; and this " motion was checked and repeated at intervals, until the arch was left in equi- " librium; and thus the arch-stones, elevated 18.9015 feet at the key, descended " with the greatest regularity to 18.40 feet in the space of five days, that being " the time employed in removing the centres, and a beautiful curve was pre- " served, leaving at this period the difference of 4¾ inches between the existing " arch and the projected one. The engineer, having proved the perfect accu- " racy of the work and the solidity of the arch, and wishing, moreover, to give " it the greatest degree of settlement of which it was capable, and of obtaining " a mass absolutely stable, that would enable him to work its spandril walls, cor- " nice, parapet, &c., in a perfect level line, directed the arch-stone to be loaded " with a mass, formed by a cube of ballast of 1854 metres and weighing about " 3000 tons, which was disposed symmetrically over it, and was much beyond " what the arch when completed, with all the additional stone-work and its " greatest occasional loads, would ever have to sustain. This weight was left " upon the arch for the space of four months, and the sinking under it amounted " only to 1¾ inch (4 centimetres), leaving the difference in rise above the pro- " jected segment 2¾ inches (about 7 centimetres)."—" *Transactions of the Institu- " tion of Civil Engineers*," vol. i. page 189.

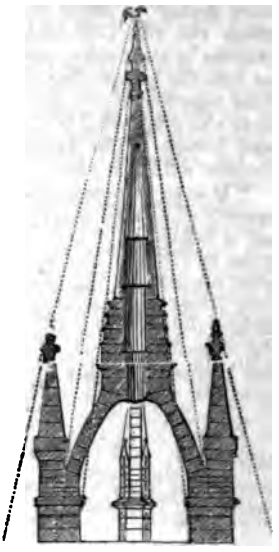
CHAPTER LII.

Of Abutments.

463. Much of the failure in modern edifices results from the defective nature of their abutments.

The Abutment must always be *sufficient* to sustain the Weight, Thrust, or Moving-power, which it has to resist; and it should be *more than sufficient;* otherwise the slightest accident, as additional weight irregularly disposed, yielding of foundation, sudden emergency or shock, will render it *insufficient.* Thus the limbs of two similar arches, meeting upon one pier, afford an abutment to each other, of the most perfect kind: but if one of the abutments supporting the other limb of one of the arches, be so weak as to cause one of the arches to give way, the other arch may also lose its exact equilibrium. Again, if one of the arches have upon its crown, more weight than the other, the other arch also may be made to settle irregularly: hence it becomes necessary, *that besides unflinchingness of foundation, there must be abutment sufficient to resist all accident.*

464. The most perfect system of abutment, is that which is in all respects equal: thus for instance, the inclined sides of a hollow conical or pyramidal steeple, afford abutment, of bulk, inclination, certainty of material, and weight, equal to those of each opposite side; and the entire circuit of abutments, gives to the whole perfect equilibrium, which nothing but violent accident, or undue settlement at the foundation, can in the slightest degree derange; and even after such settlement has taken place, frequently no fracture is observable; hence a steeple, consisting of four or more open buttresses, at which the moderns shake their heads in fear and trembling, is a more safe and certain mode of construction, than modern square towers, which, by the slightest settlement, have a tendency to fall apart, and overhang, and after that fall to premature decay, merely by the weight of their materials.



465. Thus the circular drum beneath the dome of Saint Paul's, is conical, settlement tending to consolidate its whole circuit of counter-abutments, and its form adding great charm to the internal perspective of the building,—while the perpendicular drum under the cupola of the boasted Basilica of St. Peter at Rome, is split in many places down to its very base, by the gravity and outward thrust of the cupola above it.

466. Perhaps there can hardly be found in the world, a specimen of exact counter-abutment more beautiful than the twelve stone curved ribs (forming a skeleton dome), which rise in a circle from the columns to the upper work of Bow-steeple, Cheapside. They may indeed afford a lesson in the art of constructing real domes, for they shew with what safety ribs may be raised from piers, which may support a roof of slabs of stone, which may be lapped over each other so as to prevent the penetration of rain, which will ruin any ordinary dome, the joints of which radiate to the centre of the curvature; and while the masonic stonework of such a skeleton dome, might settle considerably in each distinct rib without shewing any flaws like those in the dome of the Vatican, even the weight of the stone covering-slabs may be made to act in some sort as a counter-abutment to each rib.

467. Dr. Hutton in his History of Iron Bridges, gives the following curious account of the failure of the Iron Bridge at Staines, which appears to have been almost exactly poised upon its abutments, and to have failed, either because there was no excess of gravity in the abutments, or because their gravity was not made to operate directly against the active force of the arch.

"From the completion of the above bridge," (viz. the Iron Bridge over the River Parret, at Bridgewater,) "few of any note were executed in this country, "till about the year 1800, when the stone bridge erected over the Thames, at "Staines, gave way. On this occasion the magistrates of the counties of Mid-"dlesex and Surrey came to a resolution to erect an Iron Bridge there, on the "abutments of the stone bridge, the piers of which had failed; and Mr. Wilson, "the agent of Mr. Burdon, was employed for this purpose. He accordingly "undertook the construction of an iron arch of 181 feet span, with 16½ feet rise

" or versed sine; the arch being the segment of a circle. In this bridge the ribs " were similar to those of Wearmouth: but instead of having the blocks, of " which the ribs are composed, kept together by worked iron bars, let into " grooves in their sides, the rings of the ribs were cast hollow, and a dowel was " let into the hollow ring at each joint; so that the two adjacent blocks were " fixed together by this dowel, and by keys passing through the rings. The ribs " were also connected transversely by frames, instead of pipes as in the Sunder- " land bridge. The haunches were filled with iron rings, and the whole was " covered with iron plates.

" It is to be noted, that an iron arch, in small blocks, is not set up after the " manner of a stone one, by beginning at the abutments, and building upwards; " but is begun at the top, and continued downwards; it being easier to join the " stone to the iron, than to cut the iron at the top, if it should not fit. It is some- " what remarkable, therefore, that when these ribs were put together, and before " they joined the masonry, it was so nicely balanced, and its parts were so firmly " locked together, that after all the supports were taken out, except those next " the abutment, the whole was moved by a man, with a crowbar under the top, " and it seemed to have little tendency to push the abutments asunder. This, " however, turned out unfortunately not to be the case. The centering was taken " away, and the bridge was opened for the use of the public, about the end of the " year 1801, or beginning of 1802. At first it seemed to stand firm, and the " public were much pleased with its light and elegant appearance. But in a short " time it was found that the arch was sinking; and soon after it had gone so " much, that it was obliged to be shut up, and the old bridge opened again. The " sinking of the arch broke several of the transverse frames, and many of the " radii at the haunches; which left no doubt that the abutments had given way. " But on examination there appeared no visible sign of such failure: there was " not a crack in the masonry, nor had they gone out of the upright.—After " much investigation however, it appeared that *the whole masonry of the abut-* " *ments, to the very foundation, had slidden horizontally backwards, still preserving* " *the perpendicular, or upright position.* The failure took place in the south abut- " ment, which was supposed to be owing to a cellar, that had been made in it. " The inhabitants of Staines therefore, by the advice of an engineer whom they " consulted, had this abutment strengthened: *but no sooner was this done, than* " *the north one failed:* and they had intended to strengthen this also; but their " funds being nearly exhausted, they came to the resolution to take the whole " down, and erect a wooden bridge in its stead."—London Edition, A.D. 1812. p. 149.

468. Were it the author's wish to prove by one example more striking than any other, the falling off of science in the absolute Practice of Architecture, in these times of pretended superiority, in which the ill-taught practitioner who wishes to pursue the integrity of his art, is obliged, after he is turned adrift by his master, to re-educate himself as far as he is able, by picking up whatever scraps of scientific information may fall in his way, instead of receiving from his master at once the full depth of skill which the free-masons for centuries handed down from father to son, from master to pupil, without diminution and without reserve,—he would fearlessly instance the most singular advancement which the mid-eval architects seem, by nothing short of inspiration, to have made in the most delicate acquaintance with *Architectural Dynamics;* a knowledge which taught them at once to unite in their abutments, strength with economy, use with beauty; while in our ignorance we fancy that strength and economy are enemies of each other, and that use and beauty are of necessity opposite qualities. This refined intelligence taught them to render every necessary part of their constructions such exquisite ornaments, that the ignorant modern looking at them, without knowing their use, fancies them to be merely ornamental.

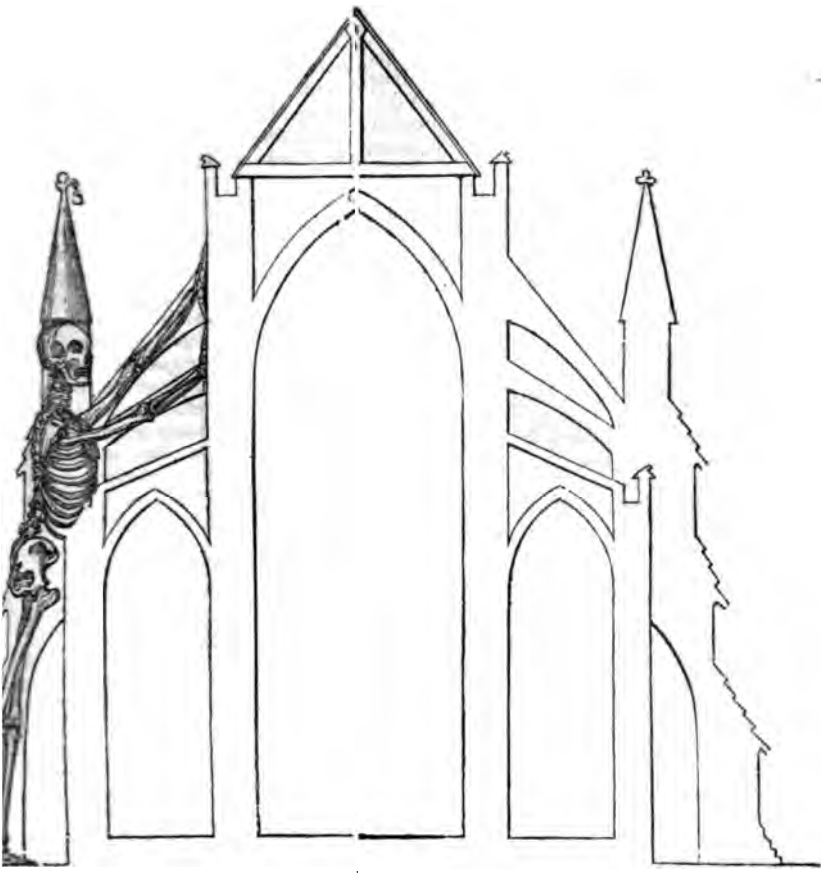
469. They first began in their vaultings with reducing the lateral thrust of the work to the smallest limits, by turning out all the otherwise more level and hazardous parts of the vaulting in what remained scarcely left its perpendicular weight upon the walls. They next greatly reduced further the weight of the vaulting by making it of small stone ribs, with a mere thin cuticle of lighter materials to close and bind the cells between the ribs; and whereas in our modern brick vaultings, the four cells-cloths are weak by their bond, and are still weaker from the soft and uneven nature of the bricks of which they are composed (rarely cemented with mortar, and wholly unfit for the purposes of any *good* work), and we know nothing of the *tympanum* of such a vault,—the mid-even builder put all the strength in the ribs, strutted his ribs across as he deemed necessary, and made the cells nearly weightless, deducted the active force down those ribs as much as might be, and then instead of leaving the lateral force which each rib was exerted itself in committing unknown and unrestrained damage on the walls of the fabric, he united their force in one point so that he knew what it was in actual power well ascertained; then knowing by the laws of equilibrium in what direction the united thrust of the ribs must be counteracted, he applied the smallest possible quantity of materials set in the form of Flying-buttresses, Pinnacles, and Wall-buttresses, that force which unrestrained might have endangered the walls. Thus by making use of only a small quantity of materials most carefully disposed of, every portion was brought into active service, he was enabled to carry weight and pierce every part of his fabric out of those parts which we know modern builders expend in raising coarse masses which perform no service, or rather in the waste which is the consequence of their weight and strength, or else suppose it necessary to counteract by the application of the same.

N Nave.
A A Aisles.
B B A Ribs of the Vaulting of the several thrusts of which all uniting at the centre C, the equilibrium of the whole is preserved, some part too long to move from C to F.
F Flying-buttress, the direction of the point C in the direction exactly suited for opposing the united thrust of the Vaulting ribs.
B Wall buttress from which the Flying buttress springs.
P Pinnacle.
The small letters indicate the repetition of sets of the same parts belonging to other divisions of the Vaulting.

470. The author comes now to a department of the Dynamic Knowledge of the Gothic Architects, which as he believes it outstrips in combination of skill and beauty, all other efforts of the architectural practitioner, ancient or modern, affords him matter of surprise, that as far as he knows or remembers, it has not been noticed by any previous writer.

[redacted]

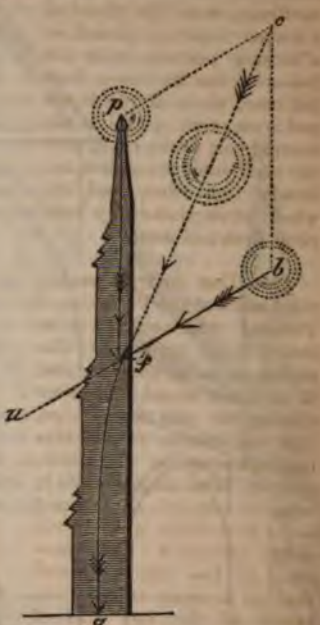
'TER LII.



471. The manner in which the Gothic architects conducted the active force
vault to one place, and then with practical certainty counter-abutted that
e by a small quantity of materials placed exactly in the situation proper for
purpose, has just been shewn: it is now proposed, to shew the wonderful
aner in which the *Flying-buttresses*, the Wall-buttresses from which they spring,
the surmounting Pinnacles, are together disposed so as with the most delicate
on of the extreme of beauty, to unite the most wonderful economy and such
nowledge of mechanics as will in vain be sought for in any other description
buildings.

472. Having found out exactly the precise place where the active force of
vaulting was pressing against the wall, they distended the *Flying-buttress* or
-boutant widely at that part, in the same manner as a modern carpenter in
porary-shoring places a board flat against a dangerous wall; they then gra-
ally concentrated this distention of the wall-thrust into one point, where the
ying-buttress joins the Wall-buttress: thus they concentrated at the head of

the Wall-buttress, all the active force communicated by the vaulting, in the same manner as in wrestling all the force received by the arms becomes concentrated in the spine, pressing its vertebræ closely together: but then as the operation of this force, would have required the Wall-buttress to be made sprawling out to a vast distance from the wall in order to prevent the active power from throwing it over, they change the course of the active force, simply by running up the head of the Wall-buttress in the form of a pinnacle, which having only a direct downward gravity, by the *Resolution of forces*, so changed the course of the active force, that it could be confined within the body of a buttress of comparatively moderate dimensions,—the downwardly-increasing gravity of the Wall-buttress in fact mingling with the force communicated to it, curved the direction of the force more and more inwards, till it was eventually re-diffused horizontally over the broad foundation of the buttress, and was from thence communicated to the earth itself. Thus pinnacles, which are vulgarly considered merely as ornaments, became the most refined instruments in the economy and security of ecclesiastical and other buildings, and like the position of the human head, had a most material influence upon the stiffness and activity of the whole frame. With this knowledge, it was, that the Gothic architects proportioned the weight and size of their pinnacles, and when we see them assuming an extraordinary altitude, as at Worcester Cathedral, it is not from idle, wild, or luxuriant caprice, but because extraordinary means were required in order to change suddenly the course of an active power, which would otherwise have expended itself beyond the body of the abutment, and by displacing it, have brought to ruin the whole work*.

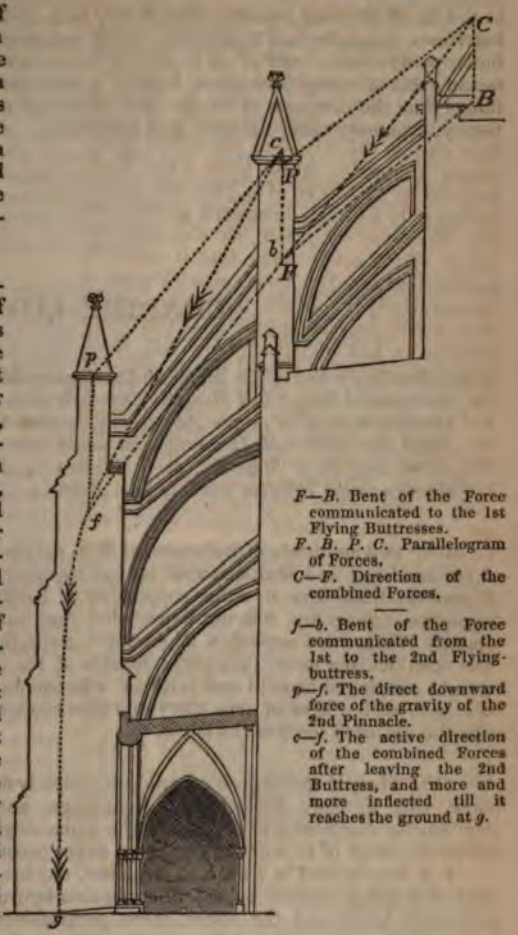


f—b. Bent of the Force communicated to the Flying-buttress by the *drift* of the Vaulting, which force would proceed unrestrained to *u*, if the Pinnacle were removed, and would consequently drive over the wall-buttress in that direction.
p—f. The direct downward force of the gravity of the Pinnacle.
c—f. The active direction of the two combined forces above-stated, more and more restrained in its downward course, within the body of the wall-buttress, till it reaches the ground at *g*.
f, b, p, c. Parallelogram of Forces.

474. They did not always stop here, for knowing that there was a portion of the *Wall-buttress* near the ground and adjoining to the side aisles, which received no thrust, and lay as it were dead, this they cut out altogether, as at Gloucester Cathedral, some of our English Chapter-houses, Westminster-hall,

* 473. Rondelet in his "*Traité Théorique et Pratique de l'Art de Bâtir*," shews that he had sagacity enough to find out the beauty of the whole management of the Dome of St. Paul's, and that he saw plainly the consolidating effect, which the weight of the covering of the Dome has upon the hollow cone; but it is singular, that this sagacity did not preserve him from in some sort deprecating the oblique meeting of the cone with its supporting piers: he did not perceive, that besides the enormous collection of surrounding abutments which the great cone possesses, the perpendicular extension of the external Peristylium above the foot of the cone, acts so as by the resolution of Forces to materially change the direction of any expanding thrust which the base of the cone may possess, and to confine it strictly within the bodies of the first set of piers.

and some of the Continental Cathedrals which have chapels set between their *Wall-buttresses** ; so that in fact, the whole form, position, and management of the counter-abutments of Gothic vaultings, were like those of a human skeleton, placed in a leaning posture, with the bones of the legs away from the base, those of the hands and arms pressing against the moving part of the vault, with the skull erect to confirm and steady the spine, and the whole strengthened by sufficient flesh and muscle.



F—B. Bent of the Force communicated to the 1st Flying Buttresses.
F. B. P. C. Parallelogram of Forces.
C—F. Direction of the combined Forces.

f—b. Bent of the Force communicated from the 1st to the 2nd Flying-buttress.
p—f. The direct downward force of the gravity of the 2nd Pinnacle.
c—f. The active direction of the combined Forces after leaving the 2nd Buttress, and more and more inflected till it reaches the ground at *g*.

475. That the true mechanical office of the Pinnacles of Pointed Architecture is as stated above, appeared to the author to be so evident, that it at once struck him after coming to this knowledge, that the double set of Flying-buttresses on the south side of Westminster Abbey, must be respectively inclined so as to receive within their solid substance the pressure of the vaulting; and that on account of the operation of the two sets of pinnacles, the lower Flying-buttresses must be set more uprightly than the upper ones: this upon examination proved to be the case, shewing that if the original builders were not fully versed in the subject (which may be greatly doubted), Wren, who restored these buttresses, was so, and probably by his great scientific knowledge was enabled to adjust them more accurately to their proper positions. The great masters who had to do with this fabric, could not avoid the great extra consumption of materials which arose from removing the great buttresses away from the wall out into the cloister-green, in order to leave room for the north avenue of the cloister: but having a difficult task to perform, they performed it with admirable skill, and know-

* Mr. Savage, at the New Chelsea Church, has omitted the inactive parts of the Wall-buttresses in order to admit a free passage in the dry areas which surround the Basement-story of the edifice: but he has not changed the *Drift* in the Flying-buttresses by placing pinnacles over the Wall-buttresses; allowing the present Wall-buttresses of the Church to be sufficient, the present combustible ceilings over the galleries of the Church, might be exchanged for groined roofs of stone, and the addition of pinnacles would still confine the drift within the present Wall-buttresses, notwithstanding the added drift of the new side vaults.

ledge which greater than is exhibited in many of the Continental Cathedrals, some of have two sets of buttresses in order to admit side chapels.

476. With what humility should we look upon our whole modern use of buttresses, pinnacles and abutments, which we pretend are the results of a far outstripping science, and of an improved taste,—while men whom we have been in the habit of calling barbarians, have in a dark age (more enlightened in many things than the best ages of Greece and Rome) at once mingled in their works, poetry, economy, taste, strength, and invention.

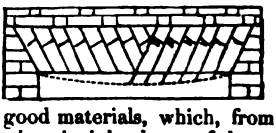
CHAPTER LIII.

Of how Small a Portion of the Materials Constituting Most Modern Edifices, performs the Intended Duty; and How this Defect Renders our Works not only Broken, but Denudes them of all proper Adornments, by that Expense which might have furnished them with such Decorations as would have Entered into, and have Grown out of, their Very Structure, being Wasted in Merely Adding an Expensive Burthen to the Efficient Parts of such Edifices.

477. In a multitude of instances, so little care is now taken that the materials of edifices shall be sound, and shall be put together with such art that they shall all perform their duty, in either supporting or holding together the fabrick, that take edifices generally, it is not improbable that less than one fourth part of the quantity of materials employed might have made them far more secure and free from flaw, leaving more than three fourths of the materials to be either saved, or to be employed in solid and intrinsic adornments, which, like those of Architecture in all her ages of true glory and true economy, should live and die alone with the strength itself of the fabric.

478. Thus, if the degree of strength which is found in an ordinary dwelling house, with its flaws distortions and sinkings, be deemed sufficient, and if a way can be discovered of producing the same degree of substantiality without the employment of so much material, no doubt great benefit will be done.

It is rare to find in a modern structure, any brickwork, which, what with the bond of it being broken by the disconnexion between the better work of hard grey-stock bricks and the softer, more perishable, and scarcely-tied facings of yellow bricks—the broken bricks in the interior of the work—the deteriorations caused by the workmen leaving in the work all those bricks which break under the operation of laying them, and which he never cements together after they are broken—what with holes and spaces left in the walls, bricks set closely only in the front and broken away at the back,—and then again considering that in most of our structures piers are placed over apertures, and very frequently upon pretended arches of gauge-work, or the more worthless pretences for arches—this part of the work is not so secure as if it had been composed of only one tenth part as much material, but that of good quality and put together with watchful care. The



author has seen modern structures of comparatively good materials, which, from being carried up in every part in defiance of every static principle, have of them-

selves gradually flawed, and in some cases pulverised nearly one half of their component bricks; while many of Wren's lofty church towers are almost without a flaw, although their interior work is evidently mainly composed of the ruins of the former buildings which were destroyed by the great fire of London.

479. In Carpentry there is often nearly as much wasteful imperfection in the disposal of the materials as in Brickwork. How constantly do we find the smaller and immaterial timbers excessively strong; while Girders, Beams, Purlins, Breast-summers, Principals, Struts, and other chief supporting timbers, are made so weak as to sink hideously, and cast out of just position the whole fabric. How rarely do we find a quartered-partition, however much of timber it may contain, which will support itself, much less the burthen whether of roofs, or floors, or brick-nogging, which is cast upon it.

480. How many modern churches have we, which pretended economy has rendered ill-proportioned, by denying them *clear-stories*,—when the least consideration will shew, that by covering them in one span, with a lumbering aggregation of misapplied carpenter's work, the burthen and expense of the roof have increased in a kind of geometrical progression with the span, and that in fact more bulk of support is required in the side walls than if the building were divided into nave and aisles; so that the saving which might have been effected in the expense of the props and substance of the roof, is enough to pay for any additional luxury of proper adornments, in which the architect might have indulged from falling into goodness of proportion, and emancipating himself from the unscientific and tasteless trammels into which architecture is at present cast.

481. The new church of St. Mark, at Clerkenwell, which is covered with a flat ceiling without ascending with a Christian, churchlike, clear-story, cost more than most of the churches built by Mr. Barry, which have clear-stories, and all the details of which possess in general a character altogether elegant and correct: but because Mr. Barry's churches are not thick and clumsy in all their parts, some will say that they are not substantial; however this may be, they are in general free from flaw, while all the flat, un-churchlike window-heads below the galleries of St. Mark's, above stated, are broken, shewing an equal violation of taste and science. The same active force of gravity which broke these window-heads, and is forcing them apart, would have pressed together true Gothic arches of tasteful proportion, however small and mean had been their materials. Such a man as Barry can only fail where perverse circumstances give him sand to work with, instead of stone, and thus deal frowardly with a reputation which is too precious to the nation to be trifled with.

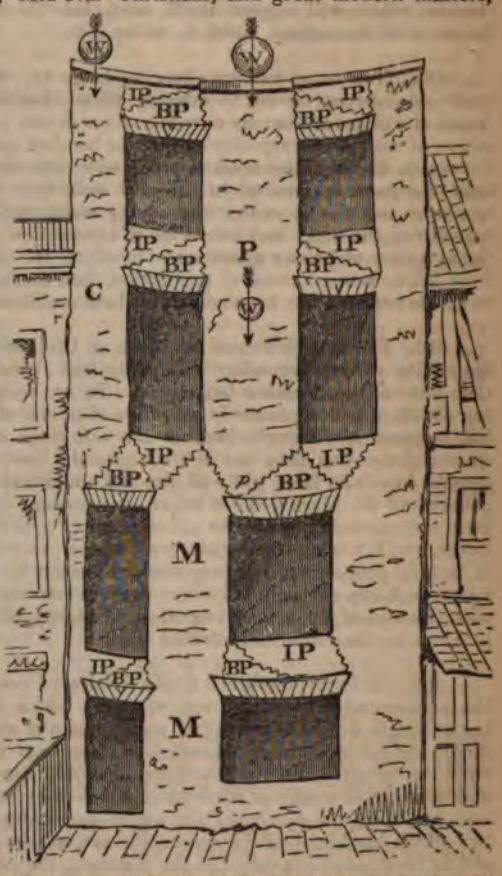
482. It is this disregard to the choice of good and efficient materials, and the economical and proper use of them, which having beggared architecture, has at length buried it in pauper style amid the spurious heaps of cements and sands, and having turned the minds of men from excellent types, has led them amid the poverty-stricken condition of architecture to rake out all the bastard and unscientific modes of fabrication, which they erroneously fancy are the only ones for which the *poverty of this age of unbounded wealth* can spare funds. It is this which has banished the carver, the mason, the worker in wainscot and brass, and in their stead has called in the plasterer, the putty-man, and the man of deal, pine, and paint.

CHAPTER LIV.

Of How the Ancients, and Most Scientific Moderns, in their Constructions, made the Masses of their buildings PYRAMIDS, *Standing upon* FIRM BASES; *while the Present Moderns Frequently make the Component Masses of their buildings* PYRAMIDS, *either with their* BASES OVER VOIDS, *or* REVERSED, *and standing only upon* POINTS.

483. The works of the Hindoos, Egyptians, Mexicans, Greeks, Romans, Byzantines, Chinese, Arabs, Mid-eval Christians, and great modern masters, will, upon strict examination, be found to consist, both in their general masses and in their component parts, of pyramids of materials, either set firmly on the ground, or as firmly posited upon the frustums of other pyramids.

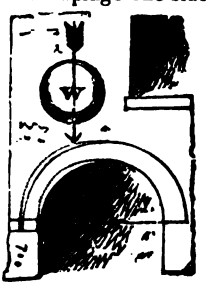
484. But however startling it may seem, a vast proportion of all the modern English buildings are composed of pyramids of materials inverted, or with their bases set over voids, and which by their own gravity, and by that of gutter-plates, roofing, and other superadditions descend as wedges urged with enormous violence; this will be made manifest, by an inspection of the adjoining diagram, which represents the form and the mode of fracture of by far the greater part of our modern buildings, whatever be their style, whatever be their materials; and yet, though one would not have thought it possible, there are not wanting some who even recommend the adoption of irregularity and want of plumb in placing the apertures of an edifice, on the score of adaptation to the apartments; but what even apparent slight excuse for this barbarism and malconstruction there may be in Urban dwellings of very small dimensions and of very contracted frontages (and



P. Great pyramid of materials standing on the point p. and driven down by its own weight and by that of the gutter-plate, roof, girders, &c., and forcing into the ground and crushing the mass M. M., and carrying down with it the baseless pyramids BP, BP, BP, BP, BP, BP, BP, BP, which it cracks from the inverted pyramids IP, IP, IP, IP, IP, IP, IP, IP, and which latter descend when their gravity has overcome the tenacity of the mortar, and thus the greater part of the work is left a mound of broken and uncemented ruins.

this will on further examination be seen to be rarely founded on reason) in edifices of a better class, it can only result, from that ignorance, idleness, or muddling which cannot arrange the apartments and component parts of an edifice, *so as to combine at once, beauty, convenience, and static propriety;* for whoever has taken delight in the planning of buildings, knows well that during the study of the general arrangements, oft-times such conveniences, beauties, and originalities, turn up in the mind of the designer, as would never have come to him from merely embodying his original abstract ideas of excellence in those departments, *un*-determined and *un*-biassed by peculiarity of site or of requirements.

485. It is true that some will boast, that by forming semicircular arches on the lower story of an edifice, they may sustain a great weight of upper work; however this may be, you may be sure that it is not proper to impinge one side of an arch by a huge burthen, while the other side of it has over it nothing but void; nor can the ordinary endowment of an edifice with four inches in thickness of bad *gauged-work* of soft shattered bricks, enable it to resist the crush of the superincumbent weight.



486. By insisting upon *building with pier over pier, and void over void,* you may build with security, and save a vast expense of materials, while the foundation thereby saved from a huge burthen of useless substance will be more secure and less expensive.

487. The builders of common London houses, are the most profligate squanderers of materials; they pretend the most sordid economy; but less than one tenth part of the quantity of materials which they use, if put together skilfully would produce more real efficient and permanent strength than they produce; their skill-less conduct eats up all convenience, beauty, and rational adornment: while the immediate and often-repeated expensive repairs which become requisite in such edifices, put the proprietors of them out of all heart, and they look at ancient excellence in architecture as a thing to be admired, but which they dread to imitate.

CHAPTER LV.

Of the Excellence of Gothic Arches.

488. A great deal has been written, relative to the strength of different kinds of Arches; but it seems that from the fall of Pointed Architecture, till very lately, sight has been lost of the principle, that *that which is* PRACTICALLY *the strongest and most convenient, is practically the* BEST.

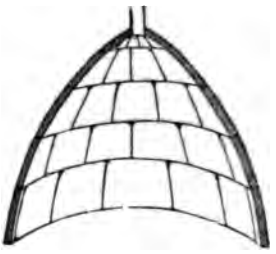
489. These properties are possessed in an eminent degree by Gothic Arches; for they will subsist firmly, of a construction much lighter, and containing much less quantity of materials than any other kind; the most ignorant may learn this, without acquiring scientific knowledge: all other arches require to be complete, or they will almost entirely fall; but aspiring pointed arches, containing no materials which are really hanging in a state of jeopardy from downward pressure, have less tendency than any other kind of arches, to thrust out their abutments and derange their haunches; for having no horizontal

crowns to fall down, they are destitute of that outwardly wedging property, which causes the ruin of other arches, and that of the piers beneath them.

490. The stones composing the lofty ancient pointed arch, *even without cement, would scarcely slide from their places;* hence we see, that although violent destruction has come to an infinite number of the finest buildings, in the pointed style, in numerous instances, *the whole sides of their arches remain perfect even up to their very points, notwithstanding their other halves have been destroyed, and three centuries of rain snow frost and storm, have preyed upon them,* while almost half the number of *our modern arches,* though possessing all their parts, *are a complication of fracture,* and need but some slight accident to remove a small portion from each of them, to cause them *to fall to utter ruin.*

491. A high praise of the strength of Gothic arches, is it, that all the handsomest, and most successful great modern domes, are nearly, if not quite, in the form of Gothic arches, merely with their points surmounted by spires or lanterns; in fact, they are a series of Gothic semi-arches, rising from a circle or other figure, and meeting together at their heads; the best domes of Europe and of Asia, are all of this form: and it is very singular that in a subterranean artificial grotto at the foot of a hill called Xochicalco in Mexico, is to be found a small cupola of the form here shown, about six feet in diameter, and rather more in height, composed of circular courses of masonry wrought and fitted together with much exactness, and with a circular vent or tube nine inches diameter extending upwardly from the apex of it.*

This singular cupola is supposed to be the work of the ancient Mexicans.



Mexican Dome.

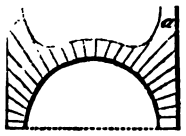
492. Nothing could better illustrate the superior stability for their purpose, of the ancient high pointed arches, than the fact of the lower arches of succeeding times requiring much more abutment, as may be seen in the immense buttresses which confine the roof of King's College Chapel at Cambridge. Perhaps some of the strongest pointed arches are to be found in Wykeham's work in the nave of Winchester Cathedral, which was erected when the more beautiful and venerable *two-centred* arch began to corrupt into the low *four-centred* arch: in this example the summit of the arch is yet steep, and the eye does not at first notice the loss of beauty resulting from the change; but in some of the arches of St. George's Chapel at Windsor, the upper parts of which are very steep and nearly straight, while the lower parts of them are small and considerably curved, a degree of ugliness is produced, which is rarely to be found in any members of Pointed Architecture.

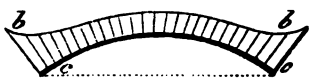
Winchester Cathedral.

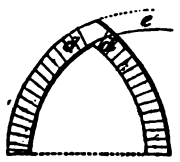
* "En un ángulo del salon mas interior, se halla fabricada en el espesor de la bovéda un cúpula "de figura conica de dos varas de diametro y algo mas de eje: en su cúspide hay un tubo de un "cuarta de diámetro, que servia de respiradero: y todo lo interior era vestido de piedras cuadradas, "puestas en filas circulares con mucha union y limpieza."—Account of Three Expeditions by Captain Dupaix in the years 1805, 6, 7, in search of the Mexican Antiquities. Paris, 1834.

CHAPTER LV.

493. Some of those who write upon the equilibrium of arches, assert that over each abutment (*a*) of a semi-circular arch a load of infinite altitude is required, in order to counter-balance the key-stone and other parts of the arch, which, from their downward pressure, are in jeopardy, and tend to thrust away the abutments intended to confine them; but as such an altitude would be neither convenient nor possible, and as great weight added to the abutments would make them sink into the earth, and thus ruin the arch, some have imagined that to omit the lower parts of the arch and to make it only a segment of a circle, with no part of the arch deeper than from *b* to *c*, is to omit that portion of it which it is neither convenient, nor even possible, to load sufficiently to resist the outwardly wedging property of the upper voussoirs. But however this subject may be involved in obscurity, and however little may from the want of actual experiments be known relative to it, yet it is certain that a very considerable portion of the whole weight of a circular segmental arch is thrusting away the abutments, whereas a high pointed arch not having its voussoirs carried up beyond *d*, *d*, there are no materials at *e*, in jeopardy, with a direct downward pressure, so that the Gothic architects in omitting all the dangerous parts of an arch, shewed a kindlier and more refined acquaintance with practical science, than those who have written the most ingenious and abstruse theories upon the equilibrium of arches, and who instead of seeking to reduce the quantity of materials in jeopardy, have only sought to burthen at an enormous expense of solid masonry, the extrados and piers of the arch in a manner which in cases of doubtful foundations might grind the whole work into the earth.







494. Notwithstanding the simple and obvious superiority of the pointed arch for many purposes of architecture, the doubts upon this subject which have been entertained by some of the most eminent men are singular. D'Agincourt, in the 1st vol. of his "Histoire de l'Art," &c. (page 82,) gives upon this subject the following curious assemblage of opinions :—

495. "Les Mathématiciens et les Auteurs de traités d'Architecture ne sont "pas tous de la même opinion, sur la force comparée de l'arc en plein-ceintre et "de l'arc en ogive, et par conséquent sur celle des deux genres de voûtes qui en "résultent; mais le plus grand nombre d'entre eux penchent en faveur de l'arc "en ogive."

496. "L. B. Alberti, il est vrai après avoir décrit l'arc en tiers point, "ajoute qu'il regarde l'arc circulaire comme le plus fort, *rectum arcum omnium "esse firmissimum cum re ipsâ censent, tum et ratione argumentoque monstrant.*" Lib. iii. cap. 13.

497. "Brunelleschi, au contraire, dans le discours que Vasari lui fait tenir "lorsqu'il rendit compte de ses opérations pour la construction de la voûte de "S. Maria del Fiore, explique comment, pour la rendre plus forte, il a préféré "lui donner *il sesto di quarto acuto.*"

498. "Cesariano, dans une note de son commentaire sur le chapitre ii. du "livre Ier de Vitruve, observe que l'arc aigu est capable de soutenir un grand "poids, dans sa partie supérieure et perpendiculairement, mais que latéralement "il offre moins de résistance que l'arc en plein-ceintre."

499. " François Sonsovino, fils du célèbre architecte de ce nom, dans une " lettre que est la 5e du tome V. des *Lettere Pittoriche*, rapporte ainsi les motifs " quiengagèrent à faire usage de l'arc en ogive, dans la construction des voûtes " du palais de la commune, à Venise : *Perchè fra le forme de' volti, è molto più " forte l' acuta che la mezza sferica, essendochè l' acuta, per essere parte di triangolo, è " difficile che per l' angolo nel quale le due linee si urtano e serrano insieme, possa " cedere o spezzarsi.*"

500. " Blondel, dans son Cours d'Architecture, pens que l'arc en ogive a " moins de poussée. Belidor au livre II. de la Science des Ingénieurs, donne une " méthode pour calculer la poussée que les arcs circulaires et aigus exercent " vers le point de l'impost."

501. " Le P. Frisi, dans une petite dissertation imprimée à Livourne en " 1766, sous le titre de *Saggio sopra l' architettura gotica*, fait une distinction con- " forme à celle de Cessariano. Milizia, *Principi d' architettura civile*, tom. i. cap. " 17. dit formellement : *Gli archi Gotici sono i piu forti;* et tom. iii. cap. 5. *La " struttura delle volte Gotiche è la piu vantaggiosa; ha minore spenta di qualunque " altera specie di volta.*"

502. " M. Rondelet est du même sentiment, ' Les voûtes surhaussées, c'est- " à-dire dont la hauteur du ceintre est plus grande que la moitié du diamètre, ont " l'avantage de pousser moins que celles qui sont en plein-ceintre.' tom. ii. p. 130. " ' Du Traité classique dont il a enrichi l'art de bâtir. Je l'ai vu, à Rome, en pré- " parer les matériaux et en recueillir les preuves, au milieu de tout ce que l'art " ancien offre de plus parfait.' "

503. " M. Francesconi, Professeur de Géometrie au Collège de St. Marc, " dans une des notes de sa dissertation sur un lettre attribuée à Castiglione ou à " Raphaël, n'approuve pas que l'auteur de cette lettre trouve plus de force à " l'arc circulaire qu'à l'arc en tiers-point."

504. Mr. Ware, in discoursing upon the same subject, notices that Gautier says, " that pointed arches were used in bridges, churches, and other buildings, ' par la faire moins de poussée.' " Sir Christopher Wren makes a similar observation adding, " that arches require less centering and thinner stones."

505. While a daily supply of fresh information continues to prove more and more, that the economy and scientific construction of Pointed Architecture, were if possible more eminent than its beauty of form and detail, it is singular that the minds of men at the present day seem to prefer the use of the *declined Gothic* of the sixteenth century, and even though they may sometimes disdain to use the festered and corrupt details of that period, they persist in using the inelegant and unsafe flat window-heads then in use, under a pretence that arched windows are unfit for domestic edifices, which do indeed require at once the greatest strength and the most judicious economy which the employment of a modern sum of money can procure. In violation of this principle, we behold the flat window-heads of the new St. Katharine's Hospital, London, broken, and in some cases where they have been vertically joined over muntins, we find the muntins themselves cleft vertically beneath the joints, by the subsidence of the superincumbent divided stones. While these small new works crumble beneath their own weight, the great eastern windows of the Cathedrals of York and Gloucester have stood for centuries, though containing each between two and three thousand superficial feet.

506. How very nearly the builders of the edifices of Pointed Architecture removed all lateral thrusting power from their arches, is still further proved by

the frequent absence of Flying-buttresses, as mentioned by Jean Rondelet, in his "*Traité Théorique et Pratique de l'Art de Batir.*" (sixth edition, vol. iv. p. 293.)

"Cette multitude d'Arcs-boutans, dont la plupart des églises Gothiques "sont garnies à l'extérieur, sont souvent superflus, ainsi que le prouvent, indépen- "damment de la théorie, plusieurs édifices de ce genre, où l'on à évité d'en "mettre, quoique leurs voûtes soient beaucoup plus élevées que la plupart des "grandes nefs au-dessus des bas-côtés des églises ordinaires, telles que la Sainte- "Chapelle à Paris, et la petite église de Cluni, près la Sorbonne, que nous avons "déjà citées, et plusieurs autres qui n'en sont pas moins solides."

507. And again, the same author observes, "La courbure de cintre la plus "favorable pour les voûtes d'arête est celle des arcs Gothiques, parce que la "partie qui pousse le plus se trouve supprimée. On trouve que l'effort de leur "poussée n'est que les trois septièmes de celui des voutes en plein-cintre de "même diamètre, épaisseur, hauteur de pied-droit et forme d'extrados, et qu'il "suffit de donner à leurs points d'appui les trois quarts de ceux des voûtes en "plein-cintre de même forme et dimension."—Vol. iv. p. 292.

508. There is yet another excellence which has been practised in the construction of Gothic arches, as mentioned by Dr. Moller, in his "*Denkmäler der Deutschen Baukunst.*"

"In regard to the buttresses or contreforts of the vaulting, we find a method "practised in the Cathedral at Cologne, which, although hitherto unnoticed, "appears to be as judicious and serviceable as it is simple.

"The lower part of the vaulting, is formed by horizontal courses of the "stone-work projecting out from the wall, similarly to the construction observed "in the treasury of Atreus. Consequently, the actual span of the vaulting, and "its volume or bulk, are proportionably decreased, while on the other hand, the "abutment is in the same degree strengthened. Still more deserving of atten- "tion is the manner in which the essential parts are so linked together as to be "rendered incapable of thrusting or giving way, and must therefore, of necessity, "remain in the precise position they were intended to be in." (*Translation by W. H. Leeds*, p. 153.)

509. Now an examination of the steeple of St. Dunstan's in the East, London, will shew that Wren, either from studying the Gothic buildings, or by his own skill, was led to practise the same mode of construction as is to be observed in the vaulting of Cologne Cathedral; for the lower courses of the four flying-buttresses of St. Dunstan's steeple, are laid horizontally, and form indeed one with the courses of the masonry of the four pinnacles surmounting the angles of the tower of the church.

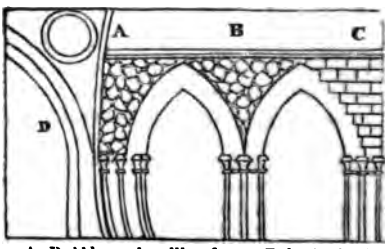
CHAPTER LVI.

Of the Defects resulting from the Use of Gothic Arches, and of the Remedy for those Defects.

510. THERE is one defect, which may by oversight subsist in an eminent degree; the property, by which pointed arches, may by reason of their steep-

ness, throw off from their extrados or backs, the spandrils or materials which are frequently piled upon them. In a range of arches of equal size and strength, this is of no ill effect; for repose is preserved, by the materials of the spandrils, tending to slide equally from the backs of each pair of arches, and thence falling upon the pier beneath them: but against the end arches, must be abutment sufficient to resist the moving power of the spandrils, or they will slide off, and the end arches becoming crippled, the adjoining arches also will be more or less deranged.

511. This is found in actual practice: a great portion of Gothic masonry, being cheap rubble-work, has a very great tendency to roll, wherever there is a want of equilibrium; hence at the crossing of the nave choir and transepts of most Gothic Cathedrals, there is more or less giving inwards of the four great central piers; and to counteract this failure, and to render those piers capable of bearing a stupendous tower or steeple, the most scientifically ingenious internal "*Arc-boutants*" have been inserted in some Cathedrals, as those of Salisbury, Wells, and Canterbury.



A. Rubble-work rolling from off the back of a Gothic arch.
B. Rubble-work retained in repose between two Gothic arches.
C. Spandril graduated in regular courses upon the back of a Gothic arch.
D. Internal arch-buttresses counteracting the bulging of the four great central piers of a Gothic Cathedral.

512. To prevent this bad effect, the spandrils over Gothic arches, and indeed over all arches, should be laid in courses of squared masonry, or brick-work; and the backs of the arches should be formed in a series of horizontal gradations, so as to have no tendency to roll from off their seats, the superincumbent masonry.

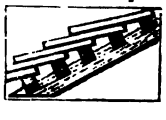
CHAPTER LVII.

Of Rafters, and of their Usual Unscientific Position.

513. RAFTERS are in general placed with their feet upon the walls, and with their heads rising to the ridge of the roof: hence from their own weight, and from the weight of the covering of the roof, they have a tendency to descend, and in so doing, to thrust out the walls of a building: this is a very destructive piece of mechanism, tending to bulge out and twist the walls; nor could this be prevented, except there were a tie-beam, to confine the feet of each pair of rafters.

514. *But if rafters be laid horizontally upon the trusses, they possess no thrusting power, and will support a slate covering without the expense of battens.*

515. In order to economise the timbers of the rafters, the determined quantity of timber intended to be employed in the trusses, may be so divided and distributed, that there may be in ordinary buildings two trusses over every pier; thus the roof will be destitute of all thrusting power, the expense and weight of purlins will be saved, and the trusses will be held firmly at



every intersection of the rafters: the author has practised this method with good success.

516. Of what importance is the preventing the thrusting power of rafters, may be seen in many Cathedrals:—the admirable architects of them, first chose, in most cases, vaulting, which scarcely had any tendency to thrust out the walls, and what slight thrusting tendency such vaulting did possess, was almost perfectly counter-poised and resisted by the weight and admirable geometrical skill of the Flying-buttresses: but while this pure science was so admirably displayed,—in numerous instances, all this excellence was destroyed, by placing over the vaulting, a cumbrous and ill-constructed timber roof, which, not being confined at its feet, overpowered the Flying-buttresses, and threw the walls of the building out of perpendicular. Many of the ancient roofs have tie-beams, but there is rarely much skill display in the mechanical trussing of the work; some of the Gothic roofs, have indeed, the vaulting so extending up into the timber roof, as to prevent proper horizontal ties being placed at the feet of the rafters.

517. Again, of what ill consequence is the omission of proper ties to roofs, is to be seen at Westminster Hall: no work on earth, perhaps, exhibits more excellence of *workmanship;* and perhaps none shows more *assiduity and skill of an inferior kind* to obviate the thrusting power of the roof; but the whole being constructed upon false and unscientific principles, it is in vain that this want of science, is concealed by intricacy of framing and excellence of workmanship: although the roof springs almost from the very ground, and although its external thrust is resisted by enormous Flying-buttresses rising only a few feet from the ground,—still the settling and expanding power of the roof has found out the want of science, and in spite of good framing, mass, and stuntedness of walling, has thrust out that walling, and the roof droops downwardly inside the building.

518. Indeed to behold the great science of the masonry, and the little science of the carpentry, of the Gothic buildings, one would almost suppose that the roofs of the Gothic buildings had been subsequently renewed by less skilful men.

519. There is no fault, into which the inexperienced or amateur architect, is more apt to fall, than the constructing of the roofs of riding-schools and other buildings, without horizontal ties: certainly all such tie-less roofs, if admitted at all, should stand upon walls leaning inwardly at the top, so as to oppose a portion of their gravity to the thrusting power of the roof, and so as that after the work has settled, the walls may not overhang. There is at Hackney, a building erected for a chapel, and now a district church, which has a roof of this description; and although the walls of it are only twenty-one feet high, they were thrust out of perpendicular 5½ inches, while the building was in course of construction. The saving in the height of the walls, which is effected by this unskilful mode of construction, is not worth consideration; and it frequently happens, as in the building at Hackney above mentioned, that more ultimate expenditure is incurred, in extra timbers, iron straps, ties and bolts, than would have been incurred in the first instance by proper construction,—while the building loses the dignity of greater external altitude, as well as of sound fabric. A well-skilled and experienced practitioner, whatever sophistry may be used, will dread to omit horizontal ties from all roofs more than fifteen or twenty feet span, whatever be the strength of the walls, unless sufficient Flying-buttresses or other extraordinary means be taken to prevent failure. And he must possess more than an ordinary share of knowledge, who can give to Flying-buttresses, such shape, inclination, and strength, as to resist the active thrusting power, of a heavy roof not

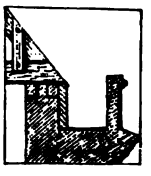
confined by horizontal internal ties. This unruly power out-mastered the masterly workman, architect, or free-mason, who designed the magnificent roof of Westminster Hall.

CHAPTER LVIII.

General Observations relative to Roofs and Gutters.

520. As it is in vain that roofs be formed upon scientific principles, without when they are so formed, they will for a long period remain unimpaired by time and weather, one of the most important considerations in their structure, is the guarding against premature decay: on this point, therefore, the author does not scruple to insert the very valuable observations of Dr. George Moller, which are to be found in his highly-esteemed work on Gothic Architecture, at the description of the Minster of Freiburg in the Breisgau. They are as follow:—

521. "*While we are making our observations upon this section, it will not be* "*irrelevant to notice how in this as well as all similar buildings the water-channels of* "*the roof and the parapets are formed without there being any attic. The timbers,* "*joists, and wall-plate, which would be liable to be injured by damp and wet, lie* "*higher than the gutters; and the intervals between the joists are not closed up exter-* "*nally, but left open to admit the air, while the gutters themselves* "*are for greater security formed of hollowed stone, or of metal.* "*Evidently rational and laudable as these precautions are, and* "*greatly as they, undoubtedly, have contributed to preserve the* "*timbers of the roof in a sound state during so many centuries, they* "*are almost entirely neglected and disregarded in our times, when* "*it is usual to form the gutters above the level of the wall-plate,* "*and to insert the timbers into the stone, so that they soon become* "*damp, and require a long time to get dry again. The mischievous consequence of* "*all which is that constant repairs are needed, and it frequently becomes necessary* "*entirely to renew the timber work of the roof.*



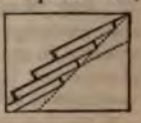
"*Nevertheless we find the same perverse practice in all our modern buildings of* "*importance, and not only in Germany, but in both France and England; and* "*moreover taught in elementary works on building. Greatly however is it to be* "*wished for the interests of art, that it were henceforth banished, and the wiser prac-* "*tice of our forefathers adopted once more.*"

522. After these important observations by the excellent German architect, it is scarcely requisite to add here, anything relative to the situation of gutters, except that in general, gutters *over-hanging* the walls, save the timbers from rotting, better than when they are placed *within* the walls, in which latter case, if there be any leakage, all the wet runs into the building, and damages it; but then there is a drawback upon this method,—viz. that the gutters cannot, without a parapet, be readily examined and cleansed; but even this very defect has some advantage, since it frequently prevents incautious persons from ascending to the roof, and damaging the tiles or slates of it: and it must be observed, that it is very difficult in most of our slight English buildings, to place the gutters, in the excellent manner stated by Moller, from their walls not being sufficiently thick.

523. Sometimes, to keep the two sides of a gutter parallel, we place a heavy timber pole-plate *off* the walls; this saves the waste of lead, at the highest parts

of the gutter, where width is least wanted; but then there is the disadvantage in this mode of construction, of increasing the weight upon one point of the tie-beam; to prevent which from bending even at its very end, a corbeille of oak is obliged to be placed under it; and even in this case the end of the tie-beam will yield beneath the pressure of the pole-plate, so as to appear very unsightly within the building, and so as to cause the ceiling to crack.

524. With regard to the coverings of roofs, perhaps well-burnt plain tiles, would be the very best covering, if they were made larger, so as not to require such frequent lapping, from which cause, our present plain tile coverings, though each tile be laid to a flat pitch, yet the whole covering becomes both high in pitch and burthensomely heavy: hence this mode of covering, has come almost into disuse.



525. Slating, from its cheapness, lightness, and excellent appearance, can hardly be discouraged, though frequently not so durable as could be wished; it requires indeed very great attention on the part of the professional man, if the work be not done by workmen upon whom he may depend, to prevent the fraud of the slates being fixed with iron nails, instead of with nails of copper or of some other lasting material; for though small is the difference of expense, between iron nails which in two or three years corrode, and leave the slating loose and imperfect, and nails which will not corrode, yet inferior or dishonest workmen, seem to take a pleasure in this fraud, under the absurd idea, that durability and excellence of work are injurious to trade.

526. On the subject of the excellence and defects of lead for the coverings of roofs, nothing needs be said here.

527. Too much caution cannot be given to the architectural student, as well as to the employer, to avoid all pretended economical substitutes for lead, tiles, slates, and other coverings for roofs, whose excellence is well known: all such inventions have hitherto failed; and besides the loss of their own cost, a renewal of the timbers and other injured parts of the fabric has been the consequence.

Heat, cold, and weather, have such a powerful effect, in expanding, contracting, cracking, and destroying, all coverings of roofs which have not sufficient play and elasticity, that in a very short time, a roof-flat so covered, becoming a mere sieve, lets all the rain-water *into* the building, and causes everything beneath it to be destroyed. One could hardly sufficiently admire the pitchy coverings of some modern buildings, which it is said, need only the application of a hot iron, to solder every crack in them; but which require the remedial application, every hour of the day. The flats over the colonnades in the Quadrant of Regent Street, London, were so constructed, with some kind of patent covering, that in twelve years, the wet succeeded in rotting a considerable portion of the timber-work of the roofing, so that the rotted materials in falling injured and nearly killed those passing under them at the time. The Basilica of Saint Paul, at Rome, had lately some timber trusses, believed to be eight centuries old; but these had not been protected by patent compositions.

528. Perhaps the handsomest and best coverings for roofs, may be made of earth, burnt to a colour either white or grey; such may be made of any size, and may be moulded in the form of leaves, or any other pattern; and if formed with lumps upon them, the same as upon pan-tiles, they will need no pegs, which are indeed in modern plain-tiling, very improperly omitted, so that when the mortar in which they are laid perishes, they drop down and let in the rain.

529. It should be the architect's study in all roofs, to have as little as pos-

sible that will either burn or rot: if the roof-trusses were made of cast-iron, as Mr. Gwilt has made those to his restoration of the Choir of Saint Saviour's Church, Southwark; and if slight horizontal rafters reaching from truss to truss, supported tiles of the ornamental description above mentioned, all combustible materials might be banished from our invaluable Cathedrals; indeed it is a matter of no slight astonishment, that York Minster is prepared for a second conflagration, by the restoration of its objectionable ceiling and timber work.

530. Now iron and copper are comparatively so cheap, it would be a laudable exchange, if the beautiful truss-work of Saint Paul's Dome were reconstructed in cast-iron and copper, to prevent the disaster which the fire of some plumber or fanatic, will some day bring upon the cone, lantern, cupolas, and vaultings of this remarkable building.

531. The following observations, made by Dr. Robison, in his "*System of Mechanical Philosophy*," are well worthy of particular attention, though not by a professional architect.

532. "But when one builds a house, ornament alone will not do. We "must have a cover; and the enormous expense and other great inconveniences "which attend the concealment of this cover by parapets, balustrades, and "screens, have obliged architects to consider the pent roof as admissible, and to "regulate its form. Any man of sense, not under the influence of prejudice, "would be determined in this by its fitness for answering its purpose. A high "pitched roof will undoubtedly shoot off the rains and snows better than one of "a low pitch. The wind will not easily blow the dropping rain in between the "slates, nor will it have so much power to strip them off. A high pitched roof "will exert a small thrust on the walls, both because its strain is less horizontal, "and because it will admit of lighter covering; but it is more expensive, because "there is more of it. It requires a greater size of timbers to make it equally "strong, and it exposes a greater surface to the wind.

533. "There have been great changes in the pitch of roofs. Our fore-"fathers made them very high, and we make them very low. It does not, how-"ever, appear, that this change has been altogether the effect of principle. In "the simple unadorned habitations of private persons, every thing comes to be "adjusted by an experience of inconveniences which have resulted from too low "pitched roofs: and their pitch will always be nearly such as suits the climate "and covering. Our architects, however, go to work on different principles. "Their professed aim is to make a beautiful object. The sources of pleasure "arising from what we call *taste* are so various, so complicated, and even so "whimsical, that it is almost in vain to look for principle in the rules adopted by "our professed architects. We cannot help thinking that much of their practice "results from a *pedantic* veneration for the beautiful productions of Grecian "architecture. Such architects as have written on the principles of art in "respect of proportions, or what they call the ORDONNANCE, are very much "puzzled to make a chain of reasoning; and the most that they have made of "the Greek architecture is, that it exhibits a nice adjustment of strength and "strain. But when we consider the extent of this adjustment, we find that it is "wonderfully limited. The whole of it consists of a basement, a column, and an "entablature; and the entablature, it is true, exhibits something of a connection "with the frame work and roof of a wooden building; and we believe that it "really originated from the hands of the Orientals, from whom the Greeks cer-"tainly borrowed their forms and their combinations. We could easily shew "in the ruins of Persepolis, and among the tombs in the mountains (which were "long prior to the Greek architecture), the fluted column, the base, the Ionic and "Corinthian capital, and the Doric arrangement of lintels, beams, and rafters, all

"derived from unquestionable principle. The only addition made by the Greeks "was the pent roof; and the changes made by them in the subordinate forms "of things, are such as we should expect from their exquisite judgment of "beauty.

534. "But the whole of this is very limited; and the Greeks, after making "the roof a chief feature of a house, went no farther, and contented themselves "with giving it a slope suited to their climate. This we have followed, because, "in the middle parts of Europe we have no cogent reason for deviating from it; "and if any architect should deviate greatly in a building where the outline is "exhibited as beautiful, we should be disgusted; but the disgust, though felt "by almost every spectator, has its origin in nothing but habit. In the pro-"fessed architect or man of education, the disgust arises from pedantry; for "there is not such a close connection between the form and uses of a roof as "shall give precise determinations; and the mere form is a matter of indiffer-"ence.

535. "We should not therefore reprobate the high-pitched roofs of our "ancestors, particularly on the Continent. It is there where we see them in "all the extremity of the fashion, and the taste is by no means exploded as it is "with us. A baronial castle in Germany and France is seldom rebuilt in the "pure Greek style, or even like the modern houses in Britain; the high-pitched "roofs are retained. We should not call them Gothic, and ugly because Gothic, "till we shew their principle to be false or tasteless. Now we apprehend that "it will be found quite the reverse; and that though we cannot bring ourselves "to think them beautiful, we ought to think them so. The construction of the "Greek architecture is a transference of the practices that are necessary in a "wooden building to a building of stone. To this the Greeks have adhered in "spite of innumerable difficulties. Their marble quarries, however, put it in "their power to retain the proportions which habit had rendered agreeable. "But it is next to impossible to adhere to these proportions with freestone or "brick, when the order is of magnificent dimensions. Sir Christopher Wren "saw this: for his mechanical knowledge was equal to his taste. He composed "the front of St. Paul's Church in London of two orders, and he coupled his "columns; and still the lintels which form the architrave are of such length "that they could carry no additional weight, and he was obliged to truss them "behind*. Had he made but one order, the architrave could not have carried "its own weight. It is impossible to execute a Doric entablature of this size in "brick. It is attempted in a very noble front, the Academy of Arts in St. "Petersburg. But the architect was obliged to make the mutules, and other "projecting members of the corniche, of granite, and many of them broke down "by their own weight.

536. "Here is surely an error in principle. Since stone is the chief mate-"rial of our buildings, ought not the members of ornamental architecture to be "refinements on the essential and unaffected parts of a simple stone building? "There is almost as much propriety in the architecture of India, where a dome "is made in imitation of a lily or other flower inverted as in the Greek imitation "of a wooden building. The principles of masonry, and not of carpentry, should "be seen in our architecture, if we would have it according to the rules of just "taste. Now we affirm that this is the characteristic feature of what is called

* How did Dr. Robison obtain this knowledge? Is it to be found in any published work, or in any accessible delineation? Is information on this and many other subjects of scientific architecture, to be obtained from Wren's papers at Oxford?

"the Gothic architecture. In this no dependence is had on the transverse "strength of stone. No lintels are to be seen; no extravagant projections. "Every stone is pressed to its neighbours, and none is exposed to a transverse "strain. The Greeks were enabled to execute their colossal buildings only by "using immense blocks of the hardest materials. The Norman mason could "raise a building to the skies without using a stone which a labourer could not "carry to the top on his back. Their architects studied the principles of equi- "librium, and, having attained a wonderful knowledge of it, they indulged them- "selves in exhibiting remarkable instances. We call this false taste, and say "that the appearance of insecurity is the greatest fault. But this is owing to "our habits; our thoughts may be said to run in a wooden train, and certain "simple maxims of carpentry are familiar to our imagination; and in the careful "adherence to these consists the beauty and symmetry of the Greek architec- "ture. Had we been as much habituated to the equilibrium of pressure, this "apparent insecurity would not have met our eye; we would have perceived "the strength, and we should have relished the ingenuity.

537. "The Gothic architecture is perhaps entitled to the name of rational "architecture; and its beauty is founded on the characteristic distinction of our "species. It deserves cultivation; not the pitiful, servile, and unskilled copying "of the monuments; this will produce incongruities and absurdities equal to "any that have crept into the Greek architecture: but let us examine with "attention the nice disposition of the groins and spaundrels; let us study the "tracery and knots, not as ornaments, but as useful members; let us observe "how they have made their walls like honey-combs, and admire their ingenuity "as we pretend to admire the instinct impressed by the great Architect into the "bee. All this cannot be understood without mechanical knowledge; a thing "which few of our professional architects have any share of. Thus would "architectonic taste be a mark of skill; and the person who presents the design "of a building would know how to execute it, without committing it entirely to "the mason and carpenter,

"These observations are not a digression from our subject. The same "principles of mutual pressure and equilibrium have a place in roofs and many "wooden edifices; and if they had been as much studied as the Normans and "Saracens seem to have studied such of them as were applicable to their "purposes, we might have produced wooden buildings as far superior to what "we are familiarly acquainted with, as the bold and wonderful Churches still "remaining in Europe are superior to the timid productions of our stone archi- "tecture. The centres used in building the bridge of Orleans, is an instance "of what may be done in this way.

538. "The Norman architects frequently roofed with stone. Their wooden "roofs were in general very simple, and their professed aim was to dispense "with them altogether. Fond of their own science, they copied nothing from "a wooden building, and ran into a similar fault with the ancient Greeks. The "parts of their buildings which were necessarily of timber were made to imitate "stone buildings; and Gothic ornament consists in cramming everything full "of arches and spaundrels. Nothing else is to be seen in their timber works, "nay even in their sculpture.

539. "But there appears to have been a rivalship in old times between the "masons and the carpenters. Many of the baronial halls are of prodigious "width, and are roofed with timber: and the carpenters appeared to have "borrowed much knowledge from the masons of those times, and their wide "roofs are frequently constructed with great ingenuity. Their aim, like the "mason's, was to throw a roof over a very wide building without employing

" great logs of timber. We have seen roofs sixty feet wide, without having a " piece of timber in them above ten feet long and four inches square. The " Parliament House and Tron Church of Edinburgh, the great hall of Tarnaway " Castle near Elgin, are specimens of these roofs. They are very numerous on " the Continent. Indeed Britain retains few monuments of private magnificence. " Aristocratic state never was so great with us; and the rancour of our civil " wars gave most of the performances of the carpenter to the flames. West- " minster hall exhibits a specimen of the false taste of the Norman roofs. It " contains the essential parts indeed, very properly disposed; but they are " hidden or intentionally covered, with what is conceived to be ornamental; " and this is an imitation of stone arches, crammed in between slender pillars " which hang down from the principal frames, trusses, or rafters. In a pure " Norman roof, such as Tarnaway hall, the essential parts are exhibited as things " understood, and therefore relished. They are refined and ornamental; and it " is here that the inferior kind of taste or the want of it may appear. And here " we do not mean to defend all the whims of our ancestors; but we assert that " it is no more necessary to consider the members of a roof as a thing to be " concealed like a garret than the members of a ceiling, which form the most " beautiful part of the Greek architecture. Should it be said that a roof is only " a thing to keep off the rain, it may be answered, that a ceiling is only to keep " off the dust, or the floor to be trodden under foot, and we should have neither " compartments in the one nor inlaid work or carpets on the other. The struc- " ture of a roof may therefore be exhibited with propriety, and made an orna- " mental feature. This has been done even in Italy. The Church of St. Maria " Maggiore in Rome and several others are specimens: but it must be acknow- " ledged, that the forms of the principal frames of these roofs, which resemble " those of our modern buildings, are very unfit for agreeable ornaments, and we " have already observed, our imaginations have not been made sufficiently " familiar with the principles, and we are rather alarmed than pleased with the " appearance of the immense logs of timber which form the couples of these " roofs, and hang over our heads with every appearance of weight and danger. " It is quite otherwise with the ingenious roofs of the German and Norman " architects. Slender timbers, interlaced with great symmetry, and thrown by " necessity into figures which are naturally pretty, form altogether an object " which no carpenter can view without pleasure. And why should the gentle- " man refuse himself the same pleasure of beholding scientific ingenuity?

540. " The roof is in fact the part of the building which requires the great- " est degree of skill, and where science will be of more service than in any other " part. The architect seldom knows much of the matter, and leaves the task to " the carpenter. The carpenter considers the framing of a great roof as the " touchstone of his art; and nothing indeed tends so much to shew his judgment " and his fertility of resource.

541. " It must therefore be very acceptable to the artist to have a clear " view of the principles by which this difficult problem may be solved in the best " manner, so that the roof may have all the strength and security that can be " wished for, without an extravagant expense of timber and iron. We have " said that mechanical science can give great assistance in this matter. We " may add that the framing of carpentry, whether for roofs, floors, or any other " purpose, affords one of the most elegant and most satisfactory applications " which can be made of mechanical science to the arts of common life. Un- " fortunately the practical artist is seldom possessed even of the small portion of " science which would almost insure his practice from all risk of failure; and " even our most experienced carpenters have seldom any more knowledge than " what arises from their experience and natural sagacity. The most approved " author in our language is Price in his " British Carpenter." Mathurin Jousse

" is in like manner the author most in repute in France; and the publications " of both these authors are void of every appearance of principle. It is not " uncommon to see the works of carpenters of the greatest reputation tumble " down, in consequence of mistakes from which the most elementary knowledge " would have saved them."—*Brewster's Edition*, A.D. 1822, vol. i. § 554,

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CHAPTER LIX.

Of What Nature Teaches us with regard to the Coverings of Roofs; and of How Unwise, Unnatural, Fragile, Expensive, and Dangerous, are the Cementitious Compositions which the Unwary Invent or Adopt for the Coverings of Buildings.

542. NATURE covers the bodies and limbs of birds and beasts, with feathers and with hairs, laid in small portions one under another, beneath which the creatures may freely move, carrying their roofs with them; and she even provides many species of them with oil to throw off wet the more effectually. Man, who is in himself so little provided against the inclemencies of weather, left to his resources, soon discovered nature's mode of roofing, and adopted it. Thatch, shingles, weather-boarding, tiles, slates, lead, copper, have all long been used in this mode, with various degrees of excellence: under all these, the building may settle greatly, and yet no water penetrate the covering.

543. The pretence of improved science, or of economy, now leads the unwary to invent or to adopt various kinds of cementitious coverings; these of nature so rigid as to flaw with every jar and settlement of the fabric, and with every accident, intercept the rain-water in its flow; the rays of the sun, the contractions of frost, the slightest accidents, keep all these fragile unaccommodating substances constantly in a broken state; that water which by other coverings is thrown off, is with avidity drunk in by these, thence all within the fabric is ruined: houses thus roofed are as much exposed to the weather, as birds and beasts would be if their feathers and hair were plucked from their bodies, and were laid again upon them without order. In such roofs the laws of Nature are violated; they cannot therefore be either scientific or economical. Frequent renewal cannot lead to economy; constant fracture cannot be security; the penetration of wet, and the destruction of the supports of a roof cannot be freedom from danger. Even the construction of a roof-flat, to be covered with lead, requires more skill and caution than are usually possessed by the makers of cement roofs; what success then can attend their inferior skill, guided by improper feelings, and working with unmanageable commodities? The makers of inflammable roofs, should every where be prosecuted as public incendiaries. By the forty-seventh section of the London Building Act, roofs are directed to be covered with glass, copper, lead, tin, slate, tile, or artificial stone: if, then, in the Metropolis that description of civil liberty which requires that each man's property should be protected from consumption by his neighbour's,—if every inmate of a building should by the common laws of Nature be preserved from jeopardy,—what plea can be set up for covering roofs with bituminous tesseras, or with Jews' pitch?

CHAPTER LX.

On the Use and Abuse of Timber Partitions,

544. The *proper* use of Timber Partitions is for separating the upper stories of buildings into more divisions than the lower parts of them, without impeding the lower apartments by props for the support of the upper divisions ; and if made on true principles, they not only subsist without casting any weight upon the ceilings below them, but form the means whereby those ceilings may be more firmly upheld ; for a quartered-partition, properly formed, contains Truss-work as capable of upholding a floor, as the Trusses of a scientific roof are of upholding a ceiling of prodigious weight and span.

545. Abuse in the use of quartered-partitions, consist in the adoption of them where they reach the ground. In London, when properly constructed, they usually cost as much as walls of the best brickwork nine inches thick ; and in the country, where stone is easily obtained, they frequently cost as much as walls of unhewn stone, eighteen inches or two feet thick.

546. Sometimes we are almost compelled to use them, in order to avoid loss of space in contracted sites ; but this forms no excuse for the use of them in new buildings, in open situations where a few inches of ground are estimated at little value.

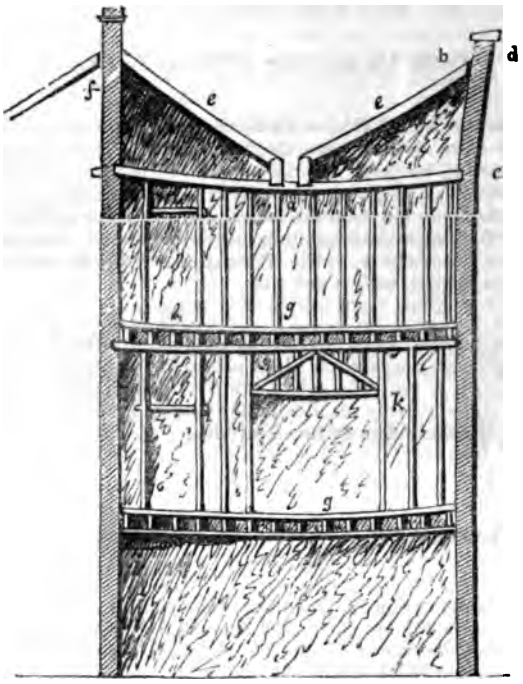
547. An absurd notion is abroad, that thin walls of brickwork are incapable of subsisting. For this there is no foundation : the defects of thin walls arise not from their thinness, but from their imperfect structure and materials. If several hundred feet in height of a steeple subsist for more than five hundred years, of masonry scarcely on an average thicker than a nine inch wall, the non-subsistence of a low nine inch wall cannot result from its want of thickness : six feet in length of nine-inch walling contains as much strength as three feet of eighteen inch walling ; and no one ever disputed that a pier of eighteen-inch brickwork, three feet wide, is capable of supporting very considerable weight.

548. The material of *good* brickwork, is harder, stronger, and more durable, than are the stones of most Gothic buildings ; while the mortar with which they are put together, can rarely be compared with the best kinds of stone-lime with which tolerable modern walls are built ; and the substance of modern bricks will stand fire an infinite deal better than most descriptions of stone.

549. The great conical steeple which bears the lantern and all the external dome of St. Paul's, has already subsisted far longer than most dwelling-houses of the best construction ; and has still suffered no decay, although the cone itself is more than ninety feet high, and is only eighteen inches thick.

550. As if it were not bad enough to support the roof of an ordinary London house (if to support it may be called) upon a drooping gutter-plate of timber, that gutter-plate itself commonly rests but upon a stack of wretched malformed quartered-partitions which lie between the back-rooms and the front-

rooms of the house, for which in most cases a wall of brickwork might be s stituted, increasing the depth of the house only four or five inches.



a. Gutter-plates.
e. e. Rafters forcing in the Gutter-plates.
g. g. Floors sunk by the settlement of the Quartered-partitions, and the Stress of the Roof.
h. Door-head forced out of level by the racking of the Quartered-partition.
k. Door-posts driven out of perpendicular by the cross-strain upon them of the Struts above the doorway.

CHAPTER LXI.

On the Abuses in Modern Architecture, in the Use of Glue, Soldet, and othe Cements.

551. In proportion as solidity and excellence of materials have disappe from English Architecture, the use of various kinds of cements has bec general. Of most of these, the questions may be asked, of what use are th architecture? And very few will be the instances in which reply may be a as to their necessity.

CHAPTER LXI.

552. Veneers, whether of wood or marble, should be wholly banished from architecture: some glue may be necessary for some kinds of cabinet-work, new or old, but of what use is it in substantial carpentry or joiner's work? A roof needs no glue; a floor needs none; a good door needs none; there should be no glue about windows, or any other wood-work properly constructed. The glue-pot is in architecture an expensive curse. It is true that it enables us to have writhed hand-rails of splinters and glue; it enables us to have window-heads and soffits circular on the plan, and circular in the elevation, which pieces of glued ugliness weakness and extravagance, the exercise of a little true skill and reasonable taste would in most cases altogether banish as barbarous. A glued deal column of moderate dimensions, costs more than one of Portland stone, or of solid wainscot, or of good seasoned English oak; but the modern joiner says, "I cannot give you a column of solid oak which will remain without flaw:" a good admission this of the superiority of modern architecture in the preparation of timber. But of this you may be certain, that he cannot give you a piece of glued modern joiner's work which will resist the least damp: hence while you find modern joiners' work worn out in fifty years, or even twenty, or even five years, the good old oak ecclesiastical work, despite of time, and the fury of man, is still sound and good, simply from having been made of good sound and solid materials, justly tenoned and fitted together without glue.

553. The abuses in the extravagantly expensive use of solder in the roofs and gutters of buildings, instead of adjusting the lead-work so as to resist the destructions of heat cold and wet, are fast fading away.

554. But the fallacy of using various descriptions of mortar, for the imaginary adornment of buildings, though in truth for the real disgrace of them, instead of merely forming the joints of their masonry and brickwork of it, seems hardly even yet sublimed to its utmost altitude; and Parker's cement alone, is now supposed to contain all the virtues of former architectural science, and to render unnecessary the true adjustment of the arches and the other once-material parts of *edifices*, and the still necessary parts of BUILDINGS. The author has even lately seen Corinthian capitals profanely made by concealing blocks of Portland stone with cement frippery.

555. The dwindling of science, taste, invention, and integrity in architecture, led to the casting of ornaments in glue-putty; and want of science and integrity, and abuse on a magnificent scale, now lead to the casting of a whole building in sand and cement. What will be said in the next century of the improvement and economy of employing the talents of a Royal Academician to design reliefs to be cast in Parker's cement? Would Phidias have done this? Would the Greeks have paid for such a wretched prodigality of his talents?

556. A single pound of glue sold retail by the joiner, without the enormous expense of labour bestowed in the use of it, costs as much as two pounds of brass. Omit the glue from a modern house, and that saving alone will be sufficient to purchase a handrail and balusters of brass, and to stud the doors of the fabric with bosses of bronze.

557. Admirers of glue will tell you of the immense weights which fresh glue will sustain; but they tell you nothing of how damp causes it to separate without any weight at all,—of how the veneers of doors cockle up,—and glued columns fall into detached staves: on these accounts, no glued or veneered work

whatever, should be admitted into any public work: no panels should be glued, but these if it should be absolutely necessary to make them wide should be made of wood which grows of sufficient width.

CHAPTER LXII.

Of Breast-summers in Building; How Abuse in the Frequent Use of them has Increased in Modern Times; Of their Inconvenience; Some Thoughts and Suggestions for Preventing the Evils Resulting from the Use of them; and Some Further Suggestions for Superseding on Many Occasions the Use of them Altogether.

558. VIEWED as a principle of construction, the use of Breast-summers is wholly inadmissible: for the super-incumbent weight upheld by them, acts upon them by direct cross-strain, a test to which no materials whatever should be put in a building formed upon a correct principle of CON-*struction*.

559. It has been stated (§ 327.), that from the shrinkage of the wood, the brickwork over a breast-summer, usually cracks, falls, and becomes disjointed. But it must be admitted, that sometimes though this be the case, a timber breast-summer is not itself defective further than happens from its shrinkage and yielding; for its fibrous nature imparts to it such toughness, that it will rarely break: but the inconvenience of leading to the disruption and distortion of the super-incumbent wall, is sufficient cause for its rejection.

560. At the present day it is in vain to argue with a trader, that his house of business would appear more respectable and elegant were it made with a due regard both to real strength and to strength of appearance: seeking only to expose his goods, and to undersell his neighbour, he little cares whether the fabric of his house be injured, or whether it be made in itself mean, provided his darling object be attained.

561. To such an extent is this description of house-breaking caused by cutting away the bottoms of houses for the *imaginary necessary* purposes of trade, that many a trader not worth a shilling, will involve himself to the extent of several hundreds of pounds in putting in a breast-summer, and destroying all the stability of a good house, for the reinstatement of the damage to which he would be unable to pay.

562. Besides the shrinkage and deflexure of wood breast-summers, their liability to rot and to burn must be added; and if they be made of cast-iron, though they will not shrink or rot, yet when fire happens, they are (though said to be fire-proof) still more disastrous and less certain than those which are of wood.

563. Breast-summers of stone, could hardly under any circumstances be relied upon.

564. The growth of the evil admission of breast-summers of wood or of iron, has even lately extended largely into public buildings; hence we see the backs of porticos raised upon high basements, fractured and sinking; and we observe

them in many other situations, where a Wren or other constructor who never lost sight of science, would have shuddered to use them.

565. The inconveniences resulting from the fracture of brick-work over breast-summers, for a long while caused the author very serious trouble: in all the examples where he used them, he had the timber cambered considerably, so as to counteract any of the effects of ordinary sinking; but this did not prevent fracture of the walling over the ends of the timber: it was a long while before it occurred to him, that this destructive effect was caused almost wholly by the shrinkage of the timber.

566. In forty instances where he used timber window-heads over the windows of Printing-offices and manufactories, he found thirty-two instances of fracture: but in all these instances, the posts between the windows were framed in one length from one window head to another, and were braced or trussed between, so that though the brick-work became fractured outwardly, after the flaws were carefully stopped no further inconvenience was suffered: in some of these instances it is true that the fracture was scarcely discernible; but the author has seen instances of heavy timber window-heads tier above tier, which have collectively so shrunk that the brick-work over the upper windows, sunk and fractured two and a half inches.

a—b. Breast-summer or window-head of timber.
c—d. Part of ditto slanted off.
e—f. A Plate, or several bars of wrought-iron, laid upon the slanted part of the timber, and resting also upon the brick pier.
g—h. Part of the brick-work, which throughout the whole height of the work is to be laid to the same slope as the timber.

Note. *The slant must increase with the height and number of the breast-summers or window-heads:* otherwise the upper timbers will sink more than the allowance.

567. Influenced by the injury and disfigurement caused to brick-work by the shrinkage of breast-summers, the author has lately thought of a method of counteracting it: it is simply to slant off the ends of a timber breast-summer or of a window-head, as much as the quantity which it may be expected to shrink; and to place a plate of wrought-iron (or several bars of wrought-iron) out of level upon the slanting part of the wood, and resting upon the brick pier at the end of the timber; and to build the brick-work over the breast-summer or window-head of the same form as the upper side of the timber, that is, out of level for about two or three feet next the ends of the wood.

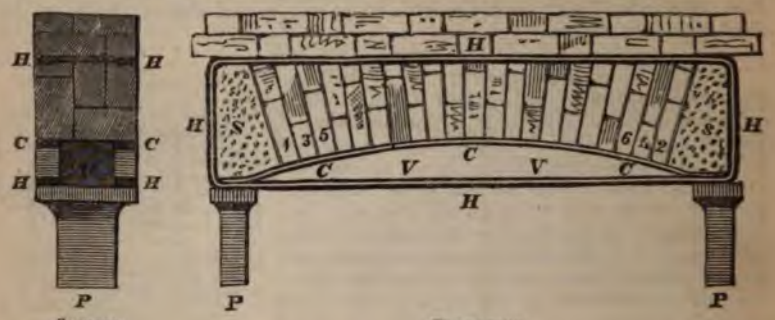
The object of this seeming mal-formation, is that when the wood has shrunk to its smallest dimensions, the top of the breast-summer or window-head may be exactly level with the top of the pier; and the iron upon which part of the brick-work will be supported having moved like a floating bridge with the fall of the tide, will also become level, leaving a small triangular crevice between it and the end of the timber, which when shrinkage has ceased may be stopped by a wedge: and thus the shrinkage of timber will cause the courses of the brick-work to settle level, instead of causing them to fracture sink, and become distorted. The experience of nearly three years, has proved a trial of this expedient to be completely successful.

a—b. The thickest part of a timber breast-summer or window-head, when so shrunk that *d* and *e* are level.
c—d. Slanted part of the timber.
e—f. Plate or bars of wrought-iron become level by the shrinkage of the timber, and leaving a vacancy above the timber.
g—h. Courses of the brick-work become also level.

568. But as the author conceives that the use of breast-summers is scarcely honourable in architecture, under any circumstances, and under any form, and of any materials, he recommends the discarding of them altogether upon every

possible occasion : there can rarely be any plea for the use of them, besides absolute necessity, or the modern false taste of supporting a heavy upward mass of fabric upon scarcely any thing apparent.

The author has lately used for the reception of walls which could only admit supports at their ends, a kind of breast-summers (or rather arches) composed of brick-work, with stone abutments, and the whole contained within two long hoops of wrought-iron : and this has proved successful ; for provided the hoops



SECTION. ELEVATION.

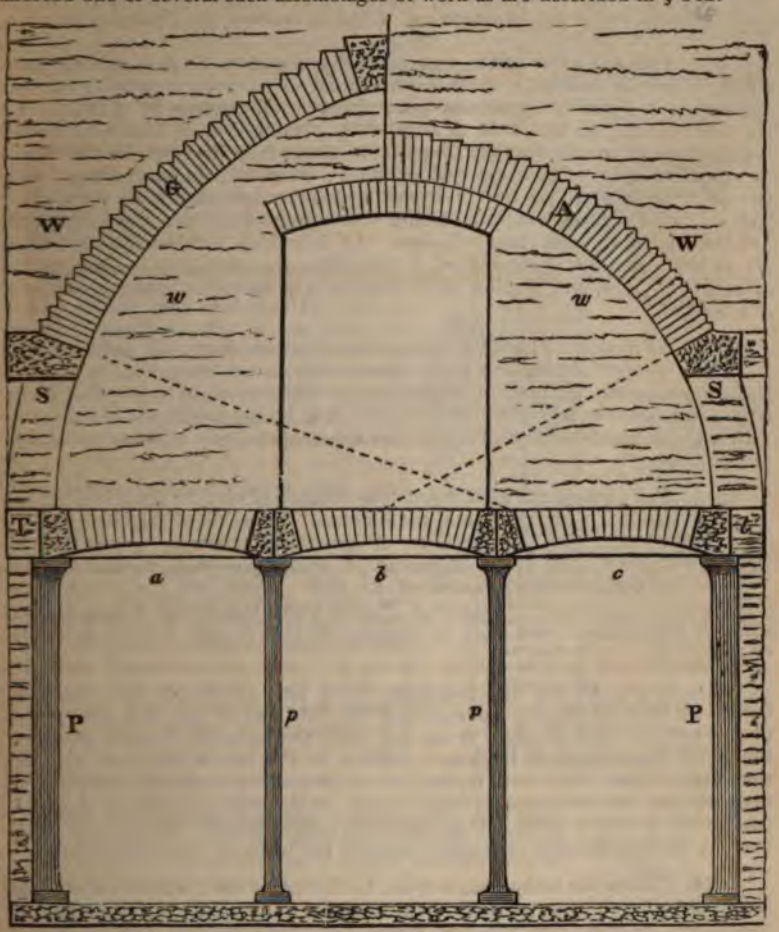
P. P. &c. Story-posts of iron to be first let into the old brick-work.
H. Hoop of wrought-iron, welded completely and inserted in the brick-work, no more of the old work being removed than will be sufficient to admit the iron. When the hoop is inserted on one side of the wall, a second similar hoop is to be cut out for and inserted on the other side of the wall.
C. &c. Cradle-bars of wrought-iron which are to be cut out for and inserted within the hoops.
S. Skew-back of stone which is next to be inserted within the hoops.
s. Another skew-back of stone which is next to be inserted within the hoops.
1, 2, 3, 4, 5, 6, &c. The order in which the old brick-work is to be gradually removed and to be replaced by a well-bonded arch of brick-work set in Parker's cement.
V. &c. Vacancy which may be eventually left between the hoops and the cradle-bars.
The old work between the story-posts is not to be removed till after all the other processes are complete.
If this mode be adopted in new work, much of the trouble and caution will be unnecessary.
The two hoops should be pitched over to prevent corrosion ; and some cross ties may be used in order to prevent the two hoops from moving further apart.

be completely welded together, and be sufficiently strong, and the arch be bonded so closely as to admit of no settlement, neither expansion nor sinking to any sensible degree can take place : this trial proving successful, he has since employed the same means in an old building ; whereby much of the trouble expense and inconvenience of shoring were saved. In adopting this method in old buildings, success will depend upon the care and address with which the work is performed *.

569. The author also suggests the following method, which he believes may with good success be adopted upon many occasions, both in new and in old buildings ; and he intends to put it into practice upon an early occasion : this is by supporting all the chief super-incumbent weight, by a strong arch of brick-work, or of masonry, semi-circular or Gothic as the case may require (but the latter always if the work is to be covered with stucco, and is in old buildings) : in this as in the last described method, shoring is nearly if not entirely superseded ; and if address and care be used, no fracture will occur. The mode to be adopted, is first to fix the story-posts of iron ; then to proceed to mark out the great arch, which may be inserted bit by bit (without endangering the

* The author lately adopted this mode successfully at the premises of Messrs. Rivington, St. Paul's Church-yard, London ; part of a back-front was to be removed, and though this was so ruinous as to be almost ready to fall, the new work was inserted with only the use of half the usual quantity of shoring ; and the operation caused no damage whatever to the work above.

fabric) till the whole is complete*. The tie across may be made very light, according to circumstances, and sometimes so as merely to be sufficient to hold the story-posts from being driven apart; and in lieu of a breast-summer, may be inserted one or several such assemblages of work as are described in § 542.



P. P. Story-posts of iron to be first inserted.
S. s. Skew-backs of stone to be in succession inserted.
A. Arch which is to be formed piecemeal, only a small part of the old work being removed at once.
G. Gothic arch, which may on some occasions be preferred to the one last described.
W. w. &c. The old wall upon which the arch is to be first marked out, and into which the arch is to be afterwards set.
p. p. Minor story-posts of iron, which may be afterwards inserted if required.
a. b. c. Arched work instead of a breast-summer formed as described in § 568.
T. t. Wrought iron tie, to prevent the arch and the story-posts from expanding.

* The author has several times adopted the method above stated of inserting an arch in an old wall without shoring, and he has done so lately at his own residence. Since writing the above, he has been told that the same method was pursued in an alteration to a new Church by the Regent's Park, London; but this method so simple and obvious he never heard of before he practised it himself.

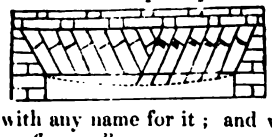
CHAPTER LXIII.

Of the Faulty Modern English Method of Covering over the External Apertures of Edifices, and of the Destruction of Property to which this Fault Leads.

570. Another cause of the vast inferiority of modern English edifices, particularly of private edifices, is the modern method of covering over their external apertures: the author sometimes goes through the streets of London, and becomes worked up into a fit of melancholy nervousness, at observing such a multitude of structures, literally dropping to pieces from fractures in the arches or other coverings of their external openings; whether built by common bricklayers, or by masons, or by surveyors, by jobbing speculators, or by wealthy bankers, little difference is to be found. As a professional man, the author feels humbled and more sunk into littleness. An incredible number of our edifices are in this condition; nor indeed is the difference very great, where pier is erected over pier, and window over window, a property of construction often lost sight of.

571. If those who have the conducting of our buildings, will not take other and more proper means, one could almost wish resort were had, to the old-fashioned unsightly method, of supporting the window arches by wooden framework; for however settled and out of level, may be the brickwork of old houses with external wooden frames, their arches are comparatively seldom fractured or dropped.

572. But perhaps the most scandalous instance of modern ignorance, or culpable imprudence, is the covering over of the apertures of structures, otherwise good, with an arrangement of bricks, possessing none of the properties of an arch. Some call the brickwork so placed, a French arch: the author is unacquainted with any name for it; and were he disposed to give it one, it might be *no-arch* or *flaw-wall*.



573. Almost all our new buildings, which are intended to have their sins hidden by external plaster, are endowed with this kind of mal-formation; even over Venetian windows eight or ten feet wide, the same silly freak is repeated; sometimes these pieces of brickwork, are set in Parker's cement, but are even then little better. The truth is, they are un-geometrically absurd; they depend upon nothing but the tenacity of the cement, or the violent friction of the bricks one against another; even if they otherwise escape fracture, the slightest settlement at the foundation is sufficient to destroy the whole of them in a building.

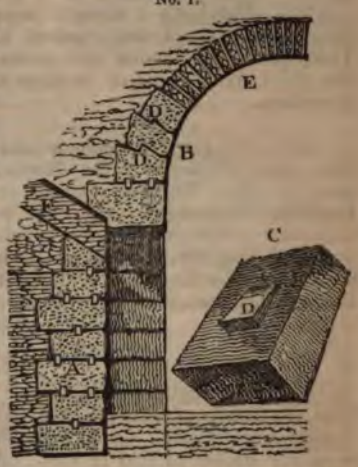
574. When the author was a child, he first observed a whole row of houses being erected, with fifty of these sham arches; he imagined at the time, that they might be some new scientific discovery in construction; but passing the same houses a year afterwards, he found that thirty of them were hideously cracked and displaced, although they had been coloured to appear like cut radiated gauged arches.

575. When a review is taken of the works of the Egyptians and Greeks, and of the care which they exhibit in the spanning of apertures with masses of solid material next to eternal,—when we behold the advances in science exhibited by the architecture of the Romans, and behold that after two thousand years arches of even contemptible materials are still firm and free from flaw,—and again when we lose ourselves in admiration of the still more economical, safe, and tasteful arches of the middle ages,—we find that down to our own

times, anxious care if not refined science of the very first quality which the respective ages afforded, always presided in its most advanced state over the Practice of Building, and that it ever employed a chief part of its ability in covering over the apertures of edifices; we thence become the more surprised that at the present day, England, London its capital, the capital of the world's wealth, should be the seat of the most reckless modes of structure, caused by the corruption and inattention which have at once taken possession of the whole building art, and particularly in the use of pseudo arches; a fact too the more remarkable, from England at the present day possessing literary and graphic works upon architecture, an immeasurable deal more illustrious than were possessed by any former age, or are now possessed by any other nation.

576. In order to exhibit the more visibly ancient care and modern inferiority in this particular, the author brings together a few of the modes followed in times past, the meanest of which is as honourable as the frequent abuse whereof he complains is dishonourable,—an abuse which has rendered the church, the palace, the hospital, the public hall, and many other public buildings, crazy alike with the meanest and most obscure private dwelling.

No. 1.



B. Lower part of the Vaulting, formed of three courses of Travertine Stone Voussoirs, joggled together.
C. View of one of the Stone Voussoirs, drawn to a larger scale.
D. D. Joggles in the form of Wedges, rising from the upper side of one Voussoir into the under side of the Voussoir immediately above it, so as to prevent one archstone from sliding upon another.
See § 200.

577. The first example here given is from a Roman sepulchre upon the Appian Way, and exhibits not only archstones of a proper wedge shape, but with a curious invention, the result of great care and skill, by which one course of the vaulting is prevented from sliding upon another: it much resembles the joggle-joints made use of in the pendent parts of a modern stone architrave.

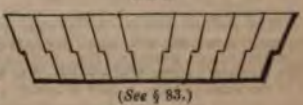
578. The Second example is taken from the abutments of an arch over the doorway of another Roman sepulchre, also upon the Appian Way, and exhibits even an advance in care and skill.

No. 2.

A. Skew-back.
B. Counter-abutment.
C. Wedge-shaped Joggle.
D. D. Plugs.
(*See* § 200.)

579. The Third example (probably of later date), is perhaps the earliest existing instance of a curious but excellent mode of preventing the Voussoirs of level stone architraves or lintels from settling downwardly, which became prevalent in various parts of Europe during the middle ages: it is from Diocletian's palace at Spalatro, in Dalmatia, which has so often been referred to as exhibiting some germs of the peculiar ornaments which afterwards became prevalent in the Romanesque, Norman, or Byzantine style of architecture; and the gradual Western spread of this same method, till it at length reached England, seems almost to furnish another argument for the

No. 3.

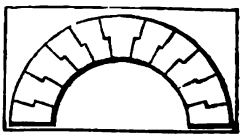


(*See* § 83.)

Oriental origin of some particular parts at least of Gothic architecture.

580. The fourth example is taken from the lower story of the reputed tomb of Theodoric, at Ravenna, and exhibits a semi-circular arch with its Voussoirs joggled or refracted as those of the third example.

No. 4.



(*See* § 90)

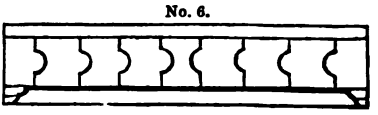
581. The Fifth example is taken from the upper part of the reputed tomb of Theodoric, at Ravenna, and is similar to the third example, but displays double precaution.

No. 5.

(*See* §84.)

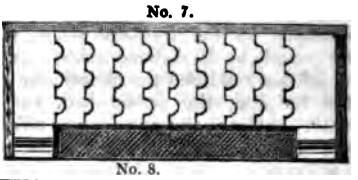
582. The Sixth example is taken from the Transom of the Norman work of the Western doorway of Rochester Cathedral.

No. 6.



583. The Seventh example is from the mantle of a fire-place in Edlingham Castle, Northumberland.

No. 7.



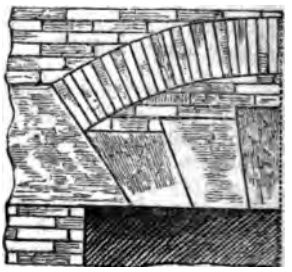
584. The Eighth example is from the mantle of a fire-place in Conisborough Castle, Kent, and is exactly similar to that at Diocletian's Palace shown in the third example*.

No. 8.

585. The Ninth example from the Gate of the Alhambra is copied from the magnificent Spanish Work published at Madrid, A.D. 1804, entitled "*Antigüedades Arabes de Espagña.*" There is even below this arch another of the Moresco horse-shoe shape: and Mr. Murphy gives two instances of the same kind of construction in the first plate of his superb work on the Church of Batalha.

No. 9.

No. 10.



586. The Tenth and Eleventh examples are from the fifth chapter of the fourth Book of Sebastian Serlio's "*Opere d' Architettura,*" and are both very excellent: the following is their author's description of them;—

"Et perche la maggior parte de' supercilij,
"o architraui che dir uogliamo, che sono posti
"sopra alcune porte, ouero botteghe, per la lar-
"ghezza dell' apertura, se la pietra non è di buo-
"nissima grossezza non puo resistere al peso, &

* The immediately preceding three specimens were kindly communicated to the author by W. Twopenny, Esq. Since the first 750 copies of this work were printed off, a tract has appeared in the 27th vol. of Archæologia, entitled "Observations on the mode adopted at various and distant periods in form-"ing a straight head over an aperture," by Sydney Smirke, Esq. In this is given a more exact delinea-tion of the example No. 5, and it exhibits a specimen of refracted voussoirs, taken from a low four-centred pointed-arch, over a kitchen chimney at Edgcot, Northamptonshire.

"per questo in processo di tempo si uiene a rom-
"pere, si come in moltissimi luoghi si puo uedere;
"si potrà per gran distantia che si sia, pur che
"le spalle dalle bande siano forti, far tal cosa di
"pezzi, nel modo qui disotto in due modi desig-
"nato, che indubitamente tal opera sarà for-
"tissima:" but experience will withhold the reader from following Serlio's further observation: "& quanto il carico disopra sarà piu grande "l' opera andera a maggior perpetuita."

No. 11.

587. The Twelfth example is taken from Mylne's work of Blackfriars' Bridge, London, and exhibits an excellent and economical piece of construction more applicable to ordinary cases than any of the preceding examples: in this example the joggles consist each of a cubic foot of hard stone. In small works copper plugs would be more proper, from requiring the removal of less of the substance of the arch-stones, in order to admit the joggles.

No. 12.

(*See* § 224.)

588. It is hardly necessary to observe that whatever ingenuity is displayed by each of the above examples, the Gothic architects made still greater advances in the science of constructing arches, for their pointed arches, as has been already observed (§ 489,) were formed without any of their parts being in jeopardy, and that they therefore needed no other means for preventing their voussoirs slipping from each other; whereas the modern pseudo-arches have none of their parts which are out of jeopardy. Another excellence of the pointed arches is, that they may be formed well of such small stones as to be scarcely either curved or wedged in form; and it is probable, that the workman by narrowly observing the natural inaccuracy and oblique angles of the blocks of stone as roughly quarried, was enabled to shape them to his purpose without any waste whatever; whereas whoever knows anything of modern masonry, is well aware of the enormous consumption both of material and labour necessary for the production of the stones of a modern arch, or of even a piece of plain square masonry.

589. There is yet another method of forming arches which is indeed still practised in masonry: it consists in joining by an elbow to each voussoir a portion of the neighbouring horizontal course of the work. At first sight this method appears to be more excellent than any other; but observation upon its practical effect will tend considerably to lower that high estimate: as the angle of the elbow will not yield, irregular settlement will cause the horizontal parts to fracture from the radial parts of the voussoirs; specimens of this mode of fracture are to be seen at the "London Institution," Moorfields, which stands on a foundation so swampy that its side colonnades and portals have settled away from the main building although they have been once rebuilt on the same account. In the northern gate of Saint Bartholomew's Hospital, London, there are examples of the same kind of fracture; and even at the side of the north portal of St. Paul's Cathedral there are in the small apertures which light the crypt, some specimens of similar rupture: in the last case the arches have above them an altitude of

one hundred feet of solid masonry, and a quick-sand below them. It must be confessed that the rustic channels of arches wrought in this form have a beautiful effect.

590. When a moderate estimate is made of the number of arches and pseudo-arches in the metropolis, which are broken from carelessness and inattention in their structure, it appears that there cannot be less than 500,000 of them: many of them from immediate fracture require repair as soon as formed, many more of them lead sooner or later to very expensive general repairs of the buildings which they should have upheld; but even considering that in their broken condition they on an average go twenty years before they are repaired, so that only 25,000 of them are repaired in any one year, and that they lead to an expense of only ten shillings each for their repair, it appears that the sum of £12,500 is annually spent in the mere repair of that work which without one shilling further outlay at first, but by the mere exercise of common discretion might have been wholly saved: such an outlay, well applied, might annually enrich the Metropolis with an additional church such as the beautiful little new structure at Forty Hill, near Enfield, but something larger; and a hundred years of such judicious useful and tasteful economy, might double the churches of the Metropolis*.

591. But without instances be given, few will believe that the mischiefs of this fault are such as the author represents, and the evil may consequently perhaps be perpetuated, the author feels himself compelled to arm his observations with real facts: with great pleasure he would have concealed these instances, but concealing them the mischief would become greater and greater; whereas in performing the unpleasant duty of directing attention to them, he flatters himself that no repetition of such severity will require to be made; and in order to shew that the fault is rather the result of general bad system than of individual incapacity, the instances given are as much varied as possible, and are by men of all degrees of repute, and they are confined to only a few instances of Public Buildings.

First then, the New Palace at Pimlico contains many broken window-heads, both in the original building, and in the subsequent additions to it: secondly, St. Bartholomew's Hospital, London, possesses only about fifty of them, while a plastered Metropolitan Hospital erected only a few years ago contains more than fourscore of them: thirdly, of the twenty-four doorways and lower windows of the New Church at Bryanston Square, London, eighteen of them have their stone architrave-lintels broken: fourthly, of the ten lower windows of St. Mark's Church, at Clerkenwell, not one of their heads has escaped fracture: fifthly, of sixty windows of the New Buildings in the Middle Temple, London, fifteen are broken: and sixthly, of seventy-one stone window-heads to the new Westminster Hospital sixty-one are fractured. It is useless to pursue the nauseous inquiry any farther: of modern private buildings, it is sufficient to say, that in the new houses alone, which have within the last four or five years sprung up in the neighbourhood of the New London Bridge, there are already one hundred and fifty fractured window-heads, some of them in desperate condition, although most of these houses are built at great expense.

592. The author has had the flat external arches of various brick buildings

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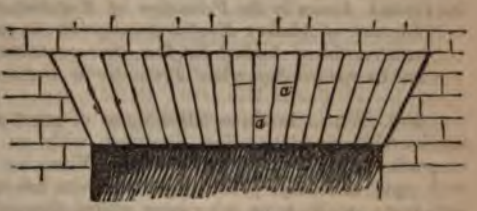
* For those who are curious to know how such a calculation could be formed, the following particulars are subjoined of the fractured window-heads in some of the streets in which the author reckoned their number: these include only such as are in the principal fronts of the houses from the ground upwards; to them must therefore be added those in the basement stories, in the backs, in the interior, and in the other parts of the houses:—.

erected under his direction, prevented from fracturing or dropping, by means of cradle-bars of wrought-iron placed invisibly below the arch-soffits, especially where he has suspected any uncertainty of foundation: and in all the buildings in which he has made the application, not the slightest symptom of defect has occurred: emboldened by this success, he feels greatly disposed to follow the same method, in all brick buildings whatsoever. The universal fracturing of modern buildings, is certainly an unadulterated disgrace to us as a profession.

593. Ganged arches, that is, arches of cut and rubbed bricks, are of all things used in building the least capable of duration, and of the resistance of fracture: made of the softest, and therefore of the worst possible bricks, the soffit or under side of the arch being usually only four inches thick, the bricks carelessly jarred away except in front, and the joints not half filled with mortar, and that mortar of no durable quality, they hardly bear their own weight: they should upon every possible occasion be discarded. But not so those arches, which are used in the counties where the best white bricks are made: they are as excellent and commendable in every respect, as those of London are bad and absurd: *the arches alluded to, are composed of very long, hard, and fine white bricks burnt of a wedge-shape;* these are not shattered by the process of cutting, and require little besides grinding to a perfect surface; they do not lose their hard outward crust for a porous texture; while from their considerable length and wedge-like upward increase, they never from any ordinary circumstance slip or fracture; and in colour, and perfection of surface and joint, they almost resemble the finest marble, while they are in this climate more durable than marble. Surely if the same method were universally adopted, less first cost would be incurred, than by the use of the present pieces of mutilated brickwork misnamed gauged *arches*.



a. Cross lines merely drawn on the surface of the arch.

594. It would be well, if in an amended *Building Act*, the external apertures of buildings were required (with some exceptions) to be made of long

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Battle Bridge	22	High Street, St. Giles's	13
Bagnigge Wells Road	83	Broad Street, St. Giles's	36
New Road	171	Tottenham Court Road	92
Great Surrey Street	240	Compton Street, Burton Crescent, containing only thirty-five houses	45
Westminster Road	108		
Circus, St. George's Fields	20	Regent Street, although coloured and repaired on an average every three years	250
Skinner Street	33		
Holborn	175		

Total taken on the same day in only thirteen streets, 1288.

From the above, it appears that in those streets which are the newest and are covered with stucco, and have their constantly-recurring fractures stopped the oftenest, there is a far greater proportion of fracture than is to be found in older streets, however ill-built they may be: thus Tottenham Court Road, which is principally of naked brick-work, and is one of the very meanest-built in the metropolis, does not contain two fifths so many fractures as are subsisting in Regent Street between its periodical white-washings, although in number of houses they are not greatly different: taking into account the more frequent repairs of Regent Street, the balance of superiority will be seven-fold against it, although it is all pretended to be architecture. These mischiefs are independent of those resulting from the shrinking and subsidence of breast-summers, which have in some cases crippled the whole walls.

wedges of white or yellow brick, or of the substance of clinkers, or of that of Malm paving-bricks. And external arches would be still more secure from fracture and settlement if two copper plugs were inserted in every arch-joint.

CHAPTER LXIV.

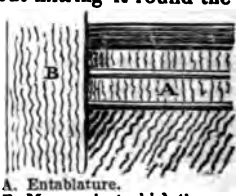
On Certain Abuses in the Formation of Entablatures, which have grown up in the Practice of Modern English Architecture, in spite of the good taste and excellent construction of Ancient Edifices, the representations of which are familiar to every one except the Superficial Pretender in Architecture.

595. While in these latter times of great architectural knowledge, but of small architectural practice, one man with an over-weening, self-complacent, busy-idleness, attempts to prove that Vitruvius was an impostor; and another, with equal certainty, proves that Vitruvius never existed, and was therefore no impostor; while some who have given themselves superior light, prove that Palladio was a corrupter of his art, and that Inigo Jones was but a fortunate quack who rose only because he had no competitors; while such, with a share of egotism more than ordinary among the scientific of mankind, assert a superiority, of skill and of practice, though rot and flaw shew the claim to practical superiority, at least, to be groundless; nothing could more forcibly prove inferiority in taste as well as practice, than the abuses which have so spread in modern English architecture in the management of entablatures.

596. He who despises what Vitruvius says upon many subjects, proves by his works that he holds in equal contempt all the best works of antiquity.

597. Two different strange fantasies have come into the heads of some practitioners, with regard to the continuation or the discontinuation of entablatures. These are both almost equally practically evil.

598. One of these abuses, consists in a sort of adoption in classical architecture, of that which has in Gothic architecture been termed "*The Perpendicular Style*." It consists in breaking off the entablature without mitring it round the angles of the composition, but letting, instead, the architrave, frieze, and cornice, abut at each end against a perpendicular mass which appears to have no relation whatever to the composition; this abuse has arisen from no other cause, than from that love of novelty which can afford no reason better than the Vicar of Wakefield gave, that he was tired of being always discreet. This abuse pervades chimney-pieces, doorways, shop-fronts, and Church steeples; it is to be found in the alteration of buildings to which it in no respects assimilates; there can be no excuse for it, except in one only instance, viz. where a quarrelsome neighbour will not allow an entablature to project a few inches over his estate: in all other cases it is indefensible; it appears weak and generally is so: in fact it is altogether a violation of the principles of classical archi-

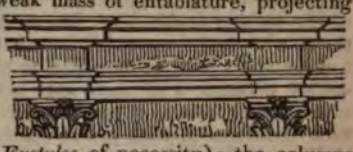


A. Entablature.
B. Mass against which the entablature abuts.

tecture; the entablature instead of being laid upon the sustaining masses appearing either only tenoned into them, or ready to slip down for want of support.

599. The other abuse is the opposite extreme; this consists in some pretended notions that the Greeks would not admit of a break in an entablature,—without inquiring whether they would have admitted inter-columniations so wide that the entablature would neither appear strong, nor in fact remain level.

600. The wisest architects in all ages, have never carried an unbroken entablature from detached column to detached column, when those columns were at an unreasonable distance apart: they were offended both by the real and by the apparent weakness; hence when necessity compelled them to use wider inter-columniations, as in triumphal arches, they knowing the bad taste and bad construction of a long, bending, weak mass of entablature, projecting far without adequate support, showed their good sense, their good taste, and their orthodox practical knowledge, by retrenching the projection of the entablature except over the columns: thus they avoided the appearance of weakness; the eye did not take notice of the unusual distance of the columns (the *Eustylos* of necessity); the columns appeared to spire upwardly: whereas, by carrying a long heavy entablature, over columns far apart, the whole composition assumes a low, mean, weak, and unclassical appearance, alike differing from Grecian and from Roman taste and skill; and indeed the attempt so to form a pseudo-grecian Triumphal Arch, has ended in the architrave revolting against so improper a treatment, and sinking so as to appear old, sunken, and distorted, almost from the very beginning of its existence. Others sensible of the unreasonableness of this abuse, but yet incapable of throwing off the shackles of perverted taste, by either placing their columns or pilasters at an "*Eustylos*" distance, such as occasion may require, and breaking the entablature over each column or pilaster if that "*Eustylos*" so demanded, have gone into an abuse if possible still worse, and have placed against the wall, some consoles to give a feeble appearance of support, to that, which if tastefully and justly constructed, should, without breaking, support itself.

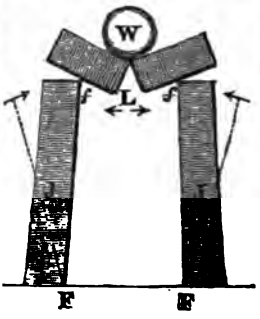


601. How the ancients, even ni the decline of art, would have abhorred such a tasteless and petty device, may be seen from the careful concealment of any such support, even where the nature of the materials of the work required some such device, and where from being within the building, some relaxing of strict propriety were admissible, if any where. (See § 228.)

A. A. Stone Skew-backs, above the Pilasters.
B. Projecting Stone Skew-back Corbeille, in the centre of the Inter-pilastration.
C. C. Pilasters.
D. D. D. D. Short flat arches, composed of bricks, hanging upon the Stone Skew-backs, and receiving with them, the Stucco decorations of the Entablature of the Architectural Order.

602. If some be still so perverse, as to attempt to erect *Grecian* structures

with their columns at undue distances, so that the architraves above them sink, they will find also that the blocks of the architrave in sinking will open at their soffits ; and the fulcrums then formed by the inner angles of the abacus of each capital, will by the descent of the architrave be thrust apart, and the columns, if of one piece each, will be moved over from their very bases ; and if of several blocks, will be thrust over gradually more and more upwardly as gravity becomes less and less. In order to counteract this evil, the columns, if placed at improper distances, should have their heads placed leaning something together, so as to counter-gravitate against the wedging power of the sinking architrave. No doubt some of those who insist upon placing their columns too far apart, will be horrified at the idea of setting columns with their axes not perpendicular, and yet they will take no care to keep them so ; nor will they place them in such positions, as that gravity, after it has acted, shall leave them in proper situations instead of in a condition to assist the ruin of the building. Perpendicular jambs under an arch invariably appear wider apart at their junction with the arch, than at their bases, even before that almost constant settlement which drives them apart ; and they in fact require to be set something together at their heads, in order to counteract that optical illusion.



J. J. Columns, Piers, or Jambs, leaning together.
L. Lintel or architrave broken by the Weight W., in its descent striving to wedge apart the fulcrums *f. f.* which are prevented from being driven apart by the masses J. J. gravitating (if moved) on the fulcrums F. F. towards *f. f.* so that the upper angles of the falling materials next W. must be destroyed before the horizontal work can much descend.

603. Mr. Hope, in his Essay upon Architecture, was wrong in condemning the Roman triumphal arches for the disposition of their columns and entablatures ; they were very different it is true from temples, but not less proper in their way ; good construction required their entablatures to be managed as they were : and the works of all nations and of almost all ages down to our times, shew that the ancients and our forefathers were rather more displeased, if possible, with bad construction than with bad taste : very few of our works raised since the middle of the eighteenth century would escape censure on both those grounds.

CHAPTER LXV.

Of the Heresy in Architecture of Turning Arch from Classical Column to Classical Column ; and of how this Abuse is Unsupported by the Practice of the Ancients, and rests upon the corrupt Examples of Mid-æval and Modern Italy.

604. In § 452 has been noticed the offence against perspective, committed by turning an arch from the head of one upwardly diminishing column to that of

another. Even if arches be turned from columns or piers which are perpendicular, they will frequently appear thrust apart at their heads, even before settlement has begun. The author lately erected a gateway of stone, required to be fourteen feet wide, the piers of which, though only ten feet high, and circumstances compelling them to be unduly small (only three feet wide), were made each inclining forward one inch and a half, yet could not this irregularity be perceived; and thus the ruin of the arch, both real and apparent, was prevented.

605. It is singular, that in these times of architectural puritanism, should be found men who unscrupulously turn arches from Grecian columns to Grecian columns. The practice rests upon no good authority. If an entablature be carried over the columns, the projection of the cornice narrowing the space suddenly, prevents that appearance of ruin which ensues when arches are turned immediately from columns, or from a block or an architrave, with little projection; and though the practice of mitring a full entablature all round a detached column cannot be commended, still it is erring on the side of nobleness, as may be seen in the London churches of St. Martin-in-the-Fields, and St. Leonard Shoreditch. The management of Palladian windows exempts them from condemnation in this respect.

606. The whole practice of the Romans in the management of their vaultings, proves that they were intimately acquainted with the excellence of this construction, its picturesqueness, and optical propriety.

607. When the Christians began to build churches from the spoils of the pagan temples, they hastily, and with little outlay, collected together the finest Corinthian columns of different edifices, and ranging them in rows, made them out, some with bases, and some with capitals of coarse workmanship; they connected them at top by rude arches, from which they spanned coarse timber roofs. But such structures could not be properly called architecture; they were rather architectural *coprolites*. Such was the famed Basilica of St. Paul, without the walls of Rome, lately destroyed;—sublime from its size,—sublime from the huge golgotha of ancient columns composing it,—sublime from its destination,—but rude and barbarous as a work of architecture.

608. The pointed architects so changed the form and details of this first idea of a Christian church,—so infused science into every part of it,—and gave such a peculiar character to its every feature, that it became under their hands altogether a perfect and distinct species. The first was as the Latin tongue barbarised: the latter was, as the English or any other complete modern European language, with a grammar,—a nerve—a turn—a facility of expression, peculiarly its own. They may have many words and names quite similar, but they each follow laws of their own; they each being as original as the other, though different in the order of chronology.

609. The mid-eval and modern Italians, instead of adding any distinguishing new feature or laws, retained the style of the Basilica of St. Paul; they invented no new garniture of outward beauty; they only carried farther the corruption of ancient details.

610. The pretended propriety of turning arches immediately from the capitals of classical columns rests upon no respectable authority; it is to be found in the worst works; and when you observe an architect, in general good, falling into this barbarous corruption, it must be imputed to the fallibility of human nature, which cannot keep purged from the contamination of bad example.

611. Notwithstanding every abettor and practiser of this vice, when driven home, must confess it to be founded upon bad taste, there are not wanting some of considerable ability, who, estimating our own good English works by this false scale, depreciate them,—making blemishes where none exist, but in their own corrupted taste, and while our own works are better; for indeed the rest of Europe does not contain any modern works so comparatively pure and so scientific as some which arose here in the middle and latter half of the 17th, and the beginning of the 18th centuries; and the evil does not stop here,—for we are now being inundated with a world of publications upon edifices of the debased Italian and French schools, which might be useful as historical records of the fluctuations of architecture, but which, acting preceptively upon men of weak judgments and shallow taste, throw our perishing architecture into worse ruin.

CHAPTER LXVI.

On Windows in the Frieze of an Architectural Order, and of the Avoidance of that Abuse.

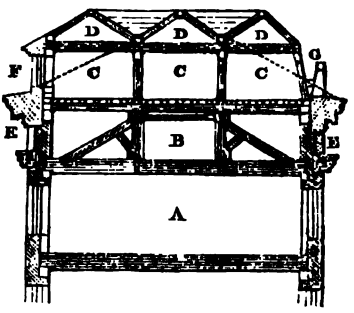
612. It may be, or it may not be, an astonishing fact, that while in modern times, rule after rule, and criticism sharpened upon criticism, seemed to have bound architecture hand and foot, and to have cast it out as it were starved and frozen to perish, that all at once, it has started up into the athletic vigour of wild profligacy, and from straightened insipiency, it has randomed into the ocean of corruption: and as if those buildings, which are otherwise correct and estimable, would be ashamed of unblemished modesty, we are now sure to find something, that redeems them with their corrupt companions.

613. Among the peculiar sins to which allusion is now made, there is none more prevalent, than that of making *windows in the frieze of an order of architecture*. We can but rarely find this dreadful abuse, in any but the inferior works, of the despised old masters. Whatever expedients be resorted to, for palliating this abuse, such expedients seem only to spread the architectural leprosy: they still gape like ghastly wounds in the lofty forehead of the building; and better even would it be to have twenty stories of windows in the height of the order, than these shocking sores. It is to be hoped, after this notice of them, that hardly will any one in London repeat the depravity, knowing as every educated architect does know, that it is altogether so scandalous that no one was ever found to defend it.

614. Most large buildings require a considerable height of roof over them, in order to admit of the proper strength to their roof-trusses. Now these Trusses may be placed within the height of the entablature of the order, rising sufficiently for strength; useful lumber-rooms, closets, or store-places, may be made between the trusses; or the beauty of loftiness, in compartments between them, may be added to the apartments below: the trusses being made of capable strength, will support an *attic story*, if required, the windows of which may be either concealed behind a blocking-course, or may show above the order, in the praiseworthy manner in which the admirable Italian architect, San Micheli, has managed the attic windows of the Pompei Palace, at Verona; while no

great trusses being required above the attic for the support of the roof, or for the binding together of the edifice, the covering of the building may be made in several small spans, supported from the great trusses below, not indeed rising higher than if there were windows in the frieze, and not appearing to crush the building with an overwhelming weight.

He who is weak enough to deform his buildings under any pretence whatsoever, with windows in their friezes, must, whatever be his ability, prepare himself for the repute of possessing bad taste, mean judgment, and want of ingenuity.



A. Best Chamber, &c.
B. Great Trusses.
C. Attic Story.
D. Low Roof over the Attic Story.
E. Frieze of the External Entablature.
F. Attic Windows.
G. Windows behind a Blocking course.

CHAPTER LXVII.

Of the Strange Repute into which, in England, Impure Architecture has Suddenly Come.

615. It requires some depth of contemplation, for the mind to discover, how in England, from a very honourable course of architectural practice during many ages, with but short interruptions, she has suddenly fallen into the worst extravagance of style; as if she needed such a fall in architectural forms, to keep pace with her degradation in practical building: as it would be utterly impossible, for the author, to succeed so well, in giving a vivid description, and a just stricture upon so lamentable an architectural sickness and furor, he begs permission, to be allowed to quote from the 48th chapter of the "*Historical Essay on Architecture*," by the late Thomas Hope, Esq., whose intimate knowledge of existing buildings, whose taste, and whose astonishing erudition on the subject, entitle him to a very high place among amateur architects.

616. "The Italians were little disposed long to suffer the restraints of that of "a different age, religion, country, with which they had nothing in common, and "which they had adopted without call or motive. They had always, in every art, "in painting, in poetry, in narrative, even in sculpture and in music, shown themselves fond of little conceits. They could not even refrain, in architecture, the "sturdiest of arts, from abusing that exquisite modesty, simplicity, consistency "of the antique, which they did not understand, as tameness and want of spirit: "thinking they displayed independence by showing inconsistency, and genius "by showing extravagance. A Fontana, a Bernini, and a Borromini, in their "corkscrew columns, their architraves *en papillote*, their pediments curled and "twisted into every unnatural shape, their architecture in perspective, their "orders, intended for flat wide temples, pyramidized one over the other, in high

" narrow arches, far outstripped in bad taste, the worst examples of the worst era " of pagan Rome.

" If, of the leading, the essential members of architecture, the shapes were " thus distorted, the consistency thus destroyed, still more were those surfaces " and outlines, those mouldings and details of a lighter and a more purely orna- " mental sort, which form, as it were, its last and brightest embroidery and fringe, " destined to experience every species of contortion. In every material, and in " every art susceptible of the influence of a taste either pure or corrupted ; in " wood, in stone, in metal, in porcelain, in glass, nay, in the tissue of the differ- " ent stuffs that serve for furniture or for clothing ; in architecture, sculpture, " painting, chasing, jewellery, embroidery, and weaving ; in the temple and the " tomb ; in the exterior and interior of houses ; in vehicles and in vessels ; in " floors, walls, and ceilings ; in the stationary parts and in the loose furniture ; " in the altar and the sideboard ; in the chair, table, chimney-piece, chandelier, " sconce, and picture-frame ; in the priest's surplice, the lady's flounce, and the " gentleman's lace ruffle ; in the chalice and the snuff-box, the vase and the " salver, the ring and the bracelet—not only all those accurate and faithful imi- " tations of actual productions, animate or inanimate, of nature or of art, which " even the Arabesques still show, and which are pleasing to the eye and the " mind, but even all regularity, all definiteness of surface and shape ; all forms " decidedly round, or square, or smooth, or projecting, or straight, or angular, " were abandoned for a sort of irregular, uncertain, involved outline, nowhere " showing a decided continuation or a decided break, and for an unmeaning " *appliqué* of clumsy scroll-work, which spread like an ulcer, from the rapidity " of its confection, and the slight degree of skill, taste, or imagination, necessary " to its execution ; which, like a cancer, ate into every moulding, and corroded " every surface, and nowhere left simplicity, variety, unity, contrast, or sym- " metry.

617. " This taste, like all the former born in Italy, soon passed into France. " It graced the dotage of the fourteenth Louis, whose youth had seen better " things. It gained strength under the Regent, and it adorned the pedestal of " the statue which represented Louis XV. on his accession, in a large powdered " periwig, with flowing curls, a square-skirted coat, high-heeled shoes, a tear in " his eye, his nose inclined upwards into the air, and his hand thrust into his " side. From France it spread like wildfire all over the Continent, and was " wafted across the Channel to the British shores, where, as it is well shown in " Italy in the modern part of Piranesi's prints, and in France in the pictures of " Watteau, it is happily exemplified in the furniture of Hogarth's compositions, " and known by the name of the old French taste, though Italy has the credit of " the invention. Its proper name should be the inane or frippery style.

618. " In fact, such was the *ennui* which its unmeaningness and insipidity " caused, that already, before the Revolution, the French had begun to shake it " off, as may be seen at Paris in the Church of Sainte Géneviève, the new addi- " tions to the Palais Bourbon, and other edifices; and that, since that period, " they have greatly improved their architecture, and all the arts connected " with it.

619. " In England, government, by taxing alike heavily, brick and stone, " which form the solid walls, and the apertures from which they are absent for " the admission of light ; discourages in architecture both solidity of construction " and variety of form ; copyhold tenures, short leases, and the custom of building " whole streets by contract, still increase the slightness, the uniformity, the " poverty of the general architecture. Here the exterior shell of most edifices

" is designed by a surveyor who has little science, and no knowledge of the fine " arts; and the internal finishing—regarded as distinct from the province of the " architect—is left to a mere upholder, still more ignorant, who most frequently " succeeds in the apparent object of marring the intentions of the builder. Thus " has arisen at least that species of variety in building which proceeds from an " entire and general ignorance of what is suitable and appropriate to the age, " nation, and localities.

620. " *Finally, as if in utter despair, some have relapsed into an admiration of " the old scroll-work—the old French style—of which the French had become " ashamed, and which they had rejected, and greedily bought it up. Not content " with ransacking every pawnbroker's shop in London and in Paris, for old buhl, old " porcelain, old plate, old tapestry, and old frames, they even set every manufacture " at work, and corrupted the taste of every modern artist by the renovation of this " wretched style.*"

621. Such is the base tyranny exercised over public taste by incompetent judges, who forget that an architect should work by science and by reason for times when a thousand fashions of dress have faded away, that the incessant clamour for ornament, without regard to quality, at length overcomes the better judgment of our most able practitioners; hence we see in the same structure of general good aspect, pilasters of Grecian form, a crowning entablature enriched by honey-suckles of the character of fallen Rome, a portico after the celebrated three columns in the Campo Vaccino, the very choicest of Rome's remains, but cankered by curled escutcheons of the worst ultra French style; and this junction of discordant details meets with present applause, though it is evident that just criticism, and the versatility of taste not founded upon science and judgment, will, before even its perishable materials have perished, remove its repute from the ranks of those edifices which, from integrity of taste, of whatever kind, and from integrity of structure, will ever be accounted among the jewels of our national arts.

CHAPTER LXVIII.

Of the Gross Corruption of the kind of Building called "Elizabethan."

622. Among the numerous architectural publications that issue from the press in these times, with such rapidity, may be mentioned those which treat of the buildings, erected in England during the reigns of Queen Elizabeth and King James the First; but while these works, some of them so splendid in their embellishments, are so valuable as furnishing historical records, yet is it to be regretted, that no works ever published, ever had a more pernicious effect upon the public taste; for some of those who view their embellishments, feel a strange inclination to copy that in which their eye delights, although they know its corruption, in the same way as children look at dirt till they desire to handle it.

623. Every one in the slightest degree acquainted with the history of architecture in England, knows that the kind of building called "*Elizabethan*," is founded in ignorance and corruption; the makers of those structures were the least learned of all builders; the only part meritorious about such structures, is the picturesque effect which they have; and this appears to have emanated from

the natural talent alone of the designers, and it frequently shines through the puerile details, and the masses of trash of the very worst kind, with which such buildings are bedizened: the beauties of such buildings, are the invention of their builders; but their defects, scattered over every part of their details, are the result of their gross ignorance alike of the pure details of the *Classical* and of the *Pointed* style of architecture: and whereas, the carvings of both the last mentioned styles are, though so different, the very perfection of architectural sculpture, the "*Elizabethan*" ornaments are invariably as grossly executed as they are grossly designed; they exhibit a grossness of chiselling, totally destitute of the elegant precision and delicacy of both the other styles. "*Elizabethan*" carving resembles the school-boy's performance with a penknife upon sticks of fire-wood, some degrees below the workmanship of Dutch toys. If ever carving of a better nature be found upon buildings of the age of Elizabeth, it either destroys the genuine "*Elizabethan*" character of the work, or making it appear of the Italian *Cinque-cento* style causes regret even greater, that workmanship so good should be accompanied by such bad taste, that materials so good and of cost so great, should not have produced something intrinsically beautiful.

624. The truth is, when the "*Elizabethan*" buildings were erected, the glory of Pointed Architecture had passed away; some of the least material members of it were retained; all the best parts of it, were totally omitted, while their place was supplied, as it were, but by the mere rumour of classical architecture, polluted at second and third hand.

625. The old flesh of Gothic architecture had, as it were, corrupted and decayed; the immense wound covering all the broad empire of Britain, was sloughing away, to produce afterwards the new sound flesh of classical architecture; but in the mean time, all was still unsoundness; and the transition sloughing, could not be esteemed healthiness, though the colours assumed by it might, to the inexperienced, seem the return of health; it was still a corrupt wound, with the former flesh almost totally decayed, and with the new flesh as yet but a rude embryo.

CHAPTER LXIX.

Of the Untenable Nature of the Praise bestowed by some upon "Elizabethan" Buildings.

626. Some persons very highly praise the "*Elizabethan*" buildings, solely on account of their general effect; but they can never defend any of their licentious and childish details, which indeed may at once be said, to contain all the faults and corruptions of design and composition, which have ever been condemned in every style of architecture, by every description of critics, of every age and of every country in the world.

627. The author, were he left by his ancestors a large mansion of this kind, would not pull it down; no, admiring its picturesque effect, and foolishly proud of this proof of ancestral dignity, he would cherish it as he would a deformed or helpless child, the more beloved the more it should stand in need of affection;

but he would no more think of building such an edifice anew, than he would wish to become the parent of a diseased offspring.

628. The following opinion of this kind of building, is taken from the description of the eleventh design for ornamental villas, by Mr. P. F. Robinson, who has published some magnificent plates of "*Elizabethan*" buildings:—

"The age of Elizabeth produced a new era in Architecture, of which we "have still many examples in this country: the deeply embayed windows, and "galleries of great length, being the chief characteristics. With the reign of "Henry VIII., however, the purity and elegance of *Gothic* architecture (as "it is still called) ceased, Hans Holbein having introduced an imitation of "the Italian, creating a jumble of the most heterogeneous forms. Longford "Castle, in Wiltshire, is a remarkable instance of this debased style, the front "being decorated with caryatides, rustic pilasters, and balustrades. It was "erected by Sir Thomas Georges, in 1591; his lady, the Marchioness Dowager "of Northampton, being one of the maids of honour to Queen Elizabeth. Ox-"nead Hall, in Norfolk, is a purer example; but the celebrated tower of the "schools at Oxford, erected in 1613, affords a most extraordinary instance of "the extreme absurdity to which this style had then been carried, the imperfect "forms of Italian architecture being mixed up with turrets, pinnacles, and bat-"tlements. Longleat, Wollaton Hall, and Audley End, are all in the same "impure style."

629. To the above may be added the fact, that in the designs lately made for the new Houses of Parliament, at Westminster, while only three or four attempts were made to produce "*Elizabethan*" designs, a multitude of architects either directly attacked in words that kind of building, or produced designs in unblended Pointed Architecture, accompanied by just praises of that untainted style.

CHAPTER LXX.

Of the Points of Inferiority of "Elizabethan" Building, and of its Mimic Nature.

630. And in truth, what is there of picturesque in the "*Elizabethan*" building, which may not always be obtained, in a purer and more dignified manner, from unmingled Pointed or Gothic architecture?

631. If pinnacles and turrets be desired, pure Gothic affords countless examples of as many different designs and forms, always with the most exquisite outlines, as well as with enrichments either simple, or gradually increasing to the utmost profusion of gorgeous and elegant ornament.

632. If parapets, either solid, or "*purfled*" with rich open tracery, be demanded, who can number the variety of examples of almost divine composition, which are to be found, as well on our own English buildings, as on those of the Continent? But in selecting from the latter, care must be taken, to avoid a transition style; as from the circumstance of the Continental proximity to the remains of *classical* architecture, *Gothic* architecture, from the dawning revival of ancient architecture, grew impure on the Continent before it ceased to exist as a living style of building; whereas, though in England, Gothic architecture was constantly changing, losing its soul-riveting ancient sublimity, but acquiring increase of richness, in a manner to make one doubt whether it improved or

retrograded in beauty, still in England, it remained unmixed with any other style of building, till almost the very last; of this, Henry the Seventh's Chapel, at Westminster, almost the last real Gothic building ever erected, is an instance; in this, there is not a particle of mixture, while in the tomb made by Torregiano, after the building was finished, there is considerable mixture of Italian with the Pointed style. Indeed it would seem, that Gothic architecture having continued in purity longer in England than in any other country, in revenge, building all at once broke up in design, in execution, and in science, and fell here suddenly to a degree of corruption lower than in any other country.

633. If windows be required, who could prefer the "*Elizabethan*" mere square holes, plainly mullioned, or transomed, to the glorious and useful adornments, which raise the pure Gothic style, in just pride, to a height in this respect, immeasurably above all other styles of art, ancient or modern? And what comparison can there be between the "*Elizabethan*" Oriel, or Bay-window, and the excellence of those from which they are meanly copied?

634. If gables be required, can any sensible man prefer those mis-shapen examples, frequently found in "*Elizabethan*" building, to the wonderfully fine examples, which are to be found in Gothic architecture, whether plain or panelled, or perforated, or magicked over with tabernacle-work foliage imagery and countless other indescribable ornaments of the most beautiful design and execution? Go to the Cathedrals and Abbey-churches of Wells, Peterborough, York, Beverley, Lincoln, Winchester, Lichfield, Exeter, Bath, Salisbury, Westminster, Beauvais, Rouen, and to many thousands of other fine different examples in England and elsewhere.

635. If porches be needed, surely it requires no ordinary prostration of mind, no slightly depraved lust of the eye, to prefer those consisting of petty debased Roman columns and arches, supported and surrounded by a thousand quaint whimseys, dancing in antics, story above story, mixed with garlands of flowers lamely carved, and here and there something of Gothic form, the whole as it were curiously minced and mixed up together, contrary to all former or subsequent usage:—whereas, in true Gothic architecture, porches are as beautiful as they are various, as chaste, correct, unblemished, and unmixed with any other style, as they are ofttimes rich in their design and composition. Can any person of feeling prefer the mimic, coarsely bedizened colonnades of the former, to the exquisite niches, corbeilles, tabernacle-work, and other multitudinous decorations of the latter?

636. With regard to chimney-shafts, as there were no examples in Roman architecture, from which debased copies could be made in "*Elizabethan*" building, therefore in structures of that kind, they are frequently copied from those in use in England shortly before; but they are very rarely, if ever, so beautiful as their proto-types: the pride of the latter Gothic chimneys, with their detached shafts with curiously reticulated surfaces, could indeed never be surpassed in any other style. Chimneys indeed are to be found of that age, somewhat copied from them; but with imitations of Roman pilasters, and other devices; but these are rarely so corrupt in taste, as the other usual parts of "*Elizabethan*" buildings.

CHAPTER LXXI.

Of the Almost Utter Impossibility of any one at the present day Really Imitating "Elizabethan" Building.

637. INDEED it is next to impossible, for any person of the present day, to design any thing *really* in the "*Elizabethan*" mode; if he call himself an architect, however great a lover he may be of depravity in art, he can hardly be so ignorant of classical architecture, as were the builders of the age of Elizabeth; he will therefore be unable, without the most grovelling mind, to acquire with any grace, the peculiar mode of sinning against art, which the old builders in that way acquired, only through inadvertence; if unable to acquire their rude puerile details, he mix together portions of good Gothic, with unmixed Roman architecture, he will totally fail: there must be a mutual naughtiness, in the two styles composing "*Elizabethan*" before they are brought together: the flowers, the brackets, the cornices, the panels, the arches, the niches, the columns, the obelisks, the parapets, the galleries, the ceilings, and every other monkeyfied quaintness, must of necessity have something of tainted bastardy about them, something which, abstractly considered, must be villanous, contrary to good architecture, and contrary to nature, in which everything is perfect as a whole, and the most minute parts of which, even if viewed through the most searching microscope, appear even yet more perfect.

638. Improve "*Elizabethan*" one way, and it becomes bad Gothic; alter it the other way, and it becomes bad Roman; now no one will deny, that good Gothic is better than bad Gothic; that good Roman is better than bad Roman; and most will agree, that good Grecian is still better than good Roman.

639. There is in the real "*Elizabethan*" structures, a *naïveté* of sinning resulting from the endeavour of ignorant men to do their best; whereas the modern imitator of such works, is obliged to assume a swaggering air in order to conceal his greater knowledge. What modern could, with any grace, adorn a British Senate house with the multitude of projecting brackets with which Elizabethan buildings are adorned? These are frequently of thin boards hewn into grotesque shapes, apparently pressed flat, with very droll faces, feet like trotters, and with round flat pendent dugs of the shape of Norfolk Biffins; the country contains a multitude of true "*Elizabethan*" structures, with these and other ornaments of the same style. The old "*Queen's Head*" public house, in Lower Street, Islington, lately destroyed, was of this kind; and there is still in Gray's Inn Lane, London, a house with a portion of its original ornaments remaining, with some uncouth brackets partly in the style above mentioned, one of which bears the date 1595. But in spite of the real character of "*Elizabethan*," one man gives that title to the Gallicised *Cinque-cento* style, and another to the domestic declined Gothic of the time of Henry VIII.

A very noble choice has emancipated the country from the derision which would have fallen upon it from artists of all nations, if the erection of an "*Elizabethan*" Senate house, had practically proved of how little use in Britain are the vast stores of *genuine* architectural knowledge, with which Britons of the eighteenth and nineteenth centuries have filled the world.

CHAPTER LXXII.

Of the Destitution of Science in "Elizabethan" Buildings.

640. It is not that "*Elizabethan*" buildings contain in their decorative parts, merely the offscourings of Pointed Architecture, blended with the rudest sketchings of classical architecture; but they contain neither the science of the former, nor the fine materials of the latter: we look in vain in "*Elizabethan*" buildings, for those daring but firm vaults, those incombustible floors, those proud spires, those richly ramified windows, which are the glory of Pointed Architecture: their builders threw away the compasses: or where they used them, the lines which they produced, appear more like those unmeaning forms, which are made by a child, when the compasses come accidentally into his hand, than the wise products of their predecessors.

CHAPTER LXXIII.

A Summary of the Merits of "Elizabethan" Building, and of the Fate which is Sure to fall upon its Attempted Revival.

641. As a book with its morals reversed by negatives, its sentences misplaced, its words misspelt, its grammar corrupted, some of the words left in English, the remainder translated into different foreign languages, and the whole badly printed upon bad paper, as such a book would be, compared with a good edition of the same work, printed correctly under the direction of its author, so is "*Elizabethan*" building, compared with good *unalloyed* architecture of any style.

642. There can be no doubt, that a very short time will suffice, to produce great wonder, how a revival could be attempted, of this sort of building, with so many in-grain demerits; the strange intoxication will subside, more rapidly than it came upon us; and contrition will employ us, in undoing the sad mischief; but we shall ever regret the waste upon it, of those funds which might have been successfully employed, in raising the character of art, but which we have with such depravity employed in the debasement of it.

CHAPTER LXXIV.

Of the End which would be put to All Known Architecture, if the Ornaments of Sacred Edifices might not be employed on any Other Occasion.

643. Perhaps, one of the most strangely absurd ideas that ever went abroad in the world, is that the ornaments of Ecclesiastical Architecture, cannot with propriety, be used about any other description of edifices: were the same principle to be applied to ancient architecture, and we were forbidden to copy the ornaments of temples in domestic edifices, what would become of our porticos,

cornices, and all the other decorations of buildings, erected after, or in imitation of, the classical style? The extending of this principle, would deprive mankind of every description of architecture.

644. Observe Westminster Hall and thousands of other Gothic secular edifices, and you will find, that after the architect had settled in his mind the *general form* of his intended work, he scrupled not to furnish it, with windows, buttresses, pinnacles, arches, columns, niches, tabernacle-work, battlements, and whatsoever else he chose; and these, much in the same style, as those with which all other buildings of the same age were adorned; even this is to be observed, in a plain way, in their very barns: but some men are fond of stumbling themselves, and of inducing every one else to do the same.

645. The truth is, that in every age of the world, in which any particular style of architecture was prevalent, the whole of the buildings, whatever their purpose, did amazingly correspond, whether palace or barn, Cathedral or chapel, mansion or cell; though richer or plainer, according to their destination: for in general, the architects, in such times, have been ignorant of all other styles of building, and therefore could not mix them up with their own peculiar architecture: for this reason, the total ignorance of classical architecture, in some countries, preserved the inventions of Gothic architecture so pure; while in Italy, it never was unblended with the ancient manner, consequently, however costly it may be, it cannot compete in purity and elegance with classical architecture, and can as little so with the Gothic architecture of more northern countries.

CHAPTER LXXV.

Of the Value of Certain Useless Burthens which Injudicious Critics would lay upon the Modern Architect, by which they would depress the Beauty and Usefulness of Architecture, which is in itself, and ever was with the Ancients, the most Beautiful and Useful of all Arts; and of how Architecture is consequently in England Retarded in its Advancement, while all other Arts and the Sciences proceed in a Rapid Approach to Excellence Unknown at any Former Period of the World.

646. In almost every former age of the world, new wants, difference of habits, new religions, change of times, peculiarities of climate and circumstances, gave to architecture the powers of new creation, which were exercised with such integrity, that although there are, and ever will be, great similarities in certain things running throughout all architecture whatsoever, yet are these marks of new creation so distinct, as to shew each variety to be complete in itself, wrought out with such high finish, and with such thorough propriety to the occasion, as to give to every different style some one superiority at least over all its existing rivals:—thus, to the Egyptian that of grandeur and solidity,—to the Grecian the qualities of simplicity and sculptural excellence,—to the Roman those of splendour, superior ingenuity, and advanced science and economy,—to the Moslem those of lightness and more curious finish,—and to the different grades of Pointed Architecture more than the grandeur of the Egyptian, greater intricacy and less bounded invention than the Moslem, construction far outstripping in science and economy the Roman, with a successful daring and a picturesqueness peculiarly its own.

647. But now, instead of fulfilling the wants of times altered in habits and religion, and embodying the best of our modern science with the taste of nature, and uniting to these the accomplished art of our modern sculptors (are they in-

ferior to the ancients?) in that unaffected way which proclaims the excellence of ancient works, and then adding the perfection of the manual dexterity and the economy of the mechanism of our own times, we bind up our resources, copying things ancient without the views of the ancients, and place upon their architecture shackles which they never knew. If they had had the same wants as we have, they would have gone to the same resources as those to which we go in the commonest unarchitectural buildings; but they would not have stopped there, but would have clothed all the required convenience in agreeable forms completely architectural in their way, without any appearance of common-place vulgarity.

648. Nothing stopped our predecessors in the course of usefulness and beauty. But as over-tight lacing causes the straitened body to protrude somewhere in a manner which few think graceful or even decent, so now straitened architectural criticism leads to a similar result, and induces corruption in building of the very worst kind.

649. The same architectural puritan who will quarrel because a fillet or some other small detail may be, in his judgment, a quarter of an inch too high or too low, caring nothing about general distribution, will place a whole column in the centre of a portico. He who doubts whether you are strictly correct in the use of some minute enrichment, feels no qualms at rearing five columns in the same row, without order or arrangement. He who will not allow you to attach to a church of Grecian architecture, a campanile decorated with Grecian orders too, (the Greeks used Grecian orders in all their works, temples, citadels, tombs, choragic monuments, houses, &c., for they had no other mode of decoration,) will set columns fastidiously Grecian, four times as far apart as the Greeks thought either safe in appearance or reality. He who will not allow you to raise a Grecian building out of the mud by a dignified platform, will grind it into the dust by all manner of super-additions which the Greeks never knew. He who will not allow you to perforate the walls of a temple for the admission of light, will glaze the frieze of the order, as though it were either quirked in the forehead or wore spectacles. He who would trammel you as to how many windows you should place under an entablature, does not scruple to sink the magnificence of his architecture, and to render his columns thin-set by raising order above order*. He who blames Wren for allowing his value of fine masonry to get the better of his taste, in governing the dimensions of his columns by the ability of our best quarries, scruples not in a stucco front, where he may mimic grandeur without fetter, to raise order above order, and to violate all proportion. He who professes the most acute veneration for antique architecture, will quarrel with the man who, in a domestic building, prefers the nobility of a magnificent order of architecture, of just proportions and intercolumniations, though with the columns attached to the wall, as in the Roman temples of Fortuna Virilis and Concord, the Maison Quarée at Nismes, and the Grecian temple of Jupiter Olympius at Agrigentum, to a meaner display of window dressings, which have little interest, and for the forms and decorations of which there can be found scarcely any authority whatever in the antique: the noblest and most classical architect will omit them altogether from between attached columns, rather than distort orders for the beauty and distribution of which he has the best authority. In prostyle architecture, there is room enough behind the columns, without distortion, for any degree of decoration to the windows: but light and comfort mostly require that detached columns should be but sparingly used about the habitable parts of domestic buildings.

* Surely the example of the Choragic monument of Lysicrates, Greek enough, and of the best age of art, is authority sufficient to confute those pretended ultra-grecians who would deny one the use of basements and rustics, even when convenience or expression dictates the use of them.

650. Two or more tiers of windows under one noble entablature, will always have a more correct and noble appearance than two or more orders one over another, or than the wretched resort to mezzanine windows, and windows in friezes.

651. One of the most absurd of all dogmas, is that whereby bad criticism would prevent a man from adopting any particular member of church architecture in a human habitation. Even the judicious Vitruvius condemns the placing of mutules in the raking cornice of a pediment, not on the score of taste, but because the ends of rafters, he states, cannot be found in such a situation; whereas it is the situation in which alone rafters, if placed scientifically, can be found. Perhaps he who built the portico of the Pantheon knew this, though he, or whoever else built the body of the fabric, had the good sense to prefer doming, which has already lasted nearly 2000 years, to wooden roofing, which rarely lasts 100 years.

652. Some, out of ultra-affectation, would deny you the use of pediments over doors and windows, especially if within-doors or under porticos. What would they then say to Soane, who, in apartments destitute of all other ordinary architectural ornaments, gives you a number of "compass" pediments? Some even go so far as to say that no doorway under a portico should have a cornice; what would then become of the doorway of the Erectheon, and of many other ancient examples? Even the excellent Milizia, in his Architectural Biography, among much admirable information and sentiment, gives us in many of his pages a wholesale condemnation of internal cornices, because, as he says, "their only use is to throw off the wet." How then could stand against criticism the Doric Guttæ, which are found even upon the architraves under the porticos of the Parthenon? or what shall we say to the hoods or labels which are found in the interiors of most of the best examples of Pointed Architecture, not only over the windows, but over the great arches of the nave and choir, and over the smaller arches of the Triforium? Are we to admit drops, only from the supposition of a defective roof? or hoods, merely as a precaution against such inconveniences?

653. Architecture herself rises above these trifles: it is a jargon which she does not stoop to understand; it would leave us nothing but plain walls, and she will have them adorned: she is very exact in her taste, but she is not squeamish. No other arts or sciences are pestered with the like absurdities; they consequently advance with rapidity. Stifled with such dross, it cannot be wondered that our art here, from day to day, retrogrades.

CHAPTER LXXVI.

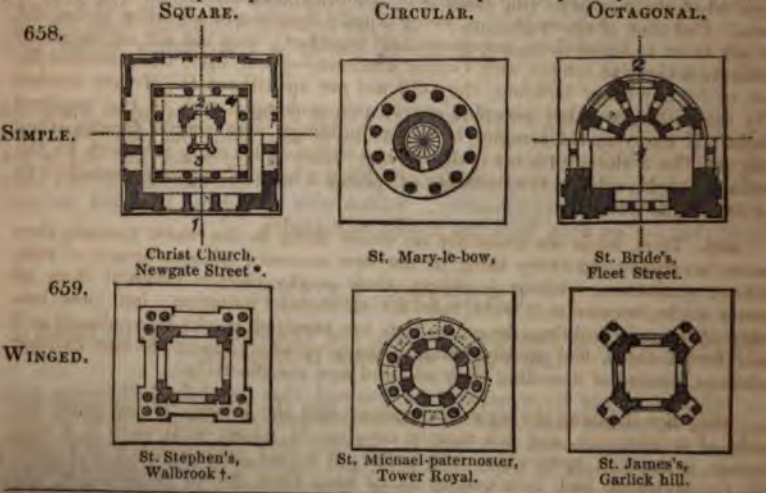
On the Affectation of Interdicting Steeples, and Campaniles, though the Details of Any Style of Architecture be Employed.

654. It cannot for a moment be doubted, that had lofty bell-towers been required in ancient times, and had ancient Grecian or Roman architects been ordered to construct such buildings, they would naturally have used such ornaments as they might be acquainted with, and would as naturally have abstained from using those with which they were unacquainted; in other words, they would, in that respect, have followed the same course as the Gothic architects. Then how absurd, that because the ancient Greeks and Romans did not need Christian bell-towers, is the criticism of those who would therefore deny the propriety of a modern architect erecting a steeple of Roman, or of any other description of architecture that he may fancy!

655. Architecture, in its benevolent nature, was created for removing the wants of mankind in every age ; if it refuse to remove those wants, it instantly dies.

656. Let those who think that the chimneys of a modern city should be its proudest spires, combine to interdict Church-steeples and campaniles, and those of St. Paul, St. Bride, St. Mary-le-bow, St. Vedast, St. Michael-paternoster, St. Magnus, St. Botolph Bishopsgate, St. Leonard Shoreditch, St. Mary Woolnoth, and St. John at Westminster, will be some of the muscles which will laugh at their taste.

657. In order that those who live in the provinces of Britain or elsewhere, and who are unacquainted with the buildings of our metropolis, may see of what variety steeples are capable, the plans of nine different Church campaniles are hereunder given ; they shew with what wonderful invention a competent knowledge of Geometry could endue a man : they shew more variety in the disposition of columns and pilasters, than is to be found in all the buildings of antiquity ; and what is still more singular, is the fact that hardly a single abuse is to be found in any of their orders, though they are neither strictly Grecian nor Roman, but designed on purpose with broad simplicity, for the purpose of due effect in their several situations ; the ornamental adjuncts of all these different works, may not be equally beautiful, but they are all equally effective in filling the outline of the structure, to the pyramidal form in the manner in which their architect outstripped all other competitors : it is needless to say, that all these examples are by WREN, a man to whom we owe full two thirds of whatever is picturesque in the views of London ; while most other edifices which break above the general line of buildings, are heavy, harsh, and unadorned, his have all the charm of richness, originality, and spiry lightness, and render London in its views perhaps the richest and most picturesque city in the world.



* The beautiful effect of this steeple was almost destroyed some years since, when the range of vases which was necessary to fill out properly its outline, was ignorantly removed from above its Ionic order : and lately a fine front prospect of this Church from Newgate Street, has been most improperly shut out by the erection of a *modern* "Elizabethan" house ; when this house is destroyed, and the remainder of the houses are removed from the end of the Post-office, Newgate Street will in succession be enriched by the views of three of the most beautiful campaniles in the world, viz., those of Bow, St. Vedast's, and Christ Church.

† The steeple of St. Stephen's, Walbrook, has lately been imitated successfully by Mr. Savage, at the new Church, Bermondsey. Wren was so inventive in his steeples, that he never even copied himself.

St. Vedast's, Foster Lane. | St. Botolph's, Bishopsgate. | St. Paul's Cathedral. (Campanile and clock-tower.)

[The figures 1, 2, 3, point to the forms of the different stages of the Plans.]

CHAPTER LXXVII.

Of the Destruction which would Fall upon all Modern Architecture from Straitened Criticism.

661. THE truth is, that were we to attend to all the absurd dogmas, with which sharp critics and dull artists have mystified, troubled, and degraded the science of architecture, it would be utterly impossible to build a modern edifice for any purpose whatsoever; not a modern door, window, buttress, pinnacle, tower, steeple, arch, battlement, column, entablature, or any thing else, but would break the silly rules, reared up against common sense by comparative ignorance,—rules, which a little consideration will prove, never governed the minds of the greatest masters, in ancient or modern times, or in the mid-ages, who always did in the best manner, to the best of their ability, whatever was required of them; they being masters of the work, and not the work masters of them. But then their employers, being equally ignorant of all other styles, did not ask them to blend them inappropriately together; they did not ask them, to perforate a Grecian temple with Gothic windows,—yet if light were needed for that, or for any other building, they did not put up without it; if they needed lofty amphitheatres, they scrupled not to pile arch upon arch to the required height; if they needed temples or other buildings, with simple façades, they designed the architecture, upon dimensions sufficient to carry the work to the destined height, without the necessity of adding a heap of excrescence-matter to eke out the altitude.

662. Thus, while we generally do every thing in the worst manner, they almost invariably did every thing in the best manner; without breach of rule, without quaintness, without jumbling, their works though different from all former works, became as it were, rules for subsequent imitation; but close imitation of them, in buildings for which they are unsuited, would be as absurd as if their first authors, had merely imitated inappropriately, some former existing buildings, instead of inventing their admired new combinations.

663. But imbibing the style, the manner, and the feeling, of any particular mode of architecture, and not merely copying its whole particulars in a lame manner, is the rock upon which critics split; it is that, upon which it is so difficult for architects and their employers to keep their minds, in times when we are not shut out from the knowledge of other styles, and consequently find it almost impossible, really to invent anything new in any style, without mixing and blending different styles together: the Greeks, the Romans, and the Gothic architects, knew no other style, therefore all their unrestrained inventions were lawful; and admiring after-ages agree that they are very, very beautiful.

CHAPTER LXXVIII.

Of the Injury which has Ensued to Modern English Architecture, from the Imitation of Bad Ancient Works.

664. One thing for which we modern English architects are eminent, is for the servile copying of ancient works; and by a strange fatality, the examples selected for this, are almost invariably, such of the ancient works, as though they may possess beauty of details, yet in general composition possess no marks of having been designed by architects. One of these may be instanced,—viz. the Choragic Monument of Thrasyllus. This is a work, the mouldings and sculpture of which, are in fine style, probably copied from some formerly existing work, but the composition itself, like many of our modern tame copies after better things, defective in all the particulars of good composition: it might be the design of some sculptor, perfect in his own art, but like most modern sculptors, as unacquainted with the principles of architectural composition, as architects are of the design and execution of sculpture: or perhaps, this building may be an unskilful and partial copy, from some ancient Grecian work, since destroyed, and possessing no more of the spirit and beauty of the excellent original, than is possessed by the myriads of our modern shop-fronts, of the spirit and design of the exquisite ancient buildings of which they are parodies. The frontispiece of this little building, now so hacked, so often well-copied, and so often ill-copied, of all sizes, and in all materials, consists of an entablature with a surmounting attic, supported only by two pilasters at the angles, with one pilaster in the centre much narrower, apparently to prevent the weight of a large crowning statue from breaking the entablature.

665. After all that has been taught, said and written upon architectural composition, one would hardly have expected that any of us would, in modern times, have erected porticos and wings to buildings, like three-legged stools, slavishly copied after the vices of this particular choragic monument, but destitute of the sculptural graces and beauty of material of the original.

666. Mr. Wilkins, perhaps the most learned literary architect in the world, having, in his "*Antiquities of Magna Græcia*," very satisfactorily proved that the rule of Vitruvius for making the columns of the flanks of temples odd in number, was not always followed by the ancients,—he instancing many considerable examples to the contrary,—it is singular that in this age of refinement, we have examples of porticos, wings, turrets, and other prominent parts of edifices, with three or other odd numbers of columns or pilasters: and some of them by whom? These shew the worse, because being mostly narrow and simple compositions, the eye immediately detects their barbarism; whereas in an ancient temple, the flank of which has 11, 13, 15, or 17 columns, without any prominent centre being marked, the irregularity cannot be discovered without the trouble of counting the number of the columns *.

667. A central column, pilaster, pier, or style, in a portico, frontispiece,

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	Roman Temples.	*Grecian Temples.*
* *Hexastyle.*—11 Columns.—Concord at Rome, and the "Maison Quarée" at Nismes.		13 Columns.—Theseus at Athens.
Octastyle.—15 ————.	Mars at Rome.	17 ————. Parthenon at Athens.

The most usual mode was, with the Greeks, to give the flank of a temple the appearance of possessing twice as many columns as the front, and one more,—with the Romans one less than twice as many: this is further proved by the Tetrastyle Temple of Fortuna Virilis at Rome, which has seven columns on each of its flanks.

wing, tower, window, or other prominent part of an edifice, exhibits such an ignorance of the genuine beauty of architectural composition, and of pure and perfect design, as justly to deprive a building deformed by such a gross vice, of all classical repute; where anything of the kind is admitted in small Gothic works, it is most frequently disguised by tracery branching apart at the head of the window or compartment in which it is introduced. And in the Athenian choragic monument the central pilaster is made narrow, shewing that its inferior designer knew its corruption, and strove to make it by smallness as little observable as possible. Again, if any one have so bad a relish for Grecian architecture as to choose inferior or imperfect examples, and would palliate the placing in a principal façade of an odd number of columns by the examples of the small side colonnades against the Propylæa of the Athenian citadel, let him remember that these are but small un-prominent accessories of a large building, and were forced obscurely into corners, so as that parts of their fronts ran behind the gigantic columns of the principal edifice.

CHAPTER LXXIX.

Of the Injury which has Fallen upon Modern English Architecture, from Badly Copying Excellent Ancient Works.

668. Not contented with copying bad antiques, we too often copy fine antiques, which in the transition become quite spoiled.

669. How many horrible copies, modifications, and partial imitations, have we of that beautiful little circular Athenian building, the Choragic Monument of Lysicrates, vulgarly called the Lantern of Demosthenes. In the original, the columns are six in number, and are placed as they ought to be, with all similar inter-columniations: but most of our modern copies of this fine work, consist of an odd number of columns, placed at irregular distances; and yet, we are the while glad enough to retain the title of architect, though such works are not architecture, but rather frippery; though such buildings are bedizened, not ornamented; though a large sum is expended, but nothing of worth is obtained*.

CHAPTER LXXX.

Of the Strange Fatality, by which in England, not only the Excellences of Ancient Works are Copied, but even their Casual or Unavoidable Defects.

670. It is a misfortune for modern English architecture, that in copying ancient works, sometimes so slavishly are they imitated, that even their accidental or unavoidable defects are re-produced. The general excellent practice of the ancients, proves that they would themselves have condemned such proceeding; it is so contrary to taste and science, that it creates in a sensitive mind, no small wonder and chagrin. How differently does a painter or a sculptor act:

* In one of the streets leading out of Covent Garden, London, is a notable parody of this beautiful example; it is indeed a complete type of modern English architecture: its columns are *five*, and placed at irregular distances; its masonry, though new, from being of Bath stone, presents a coarse and filthy appearance; and its architrave is broken at almost every intercolumniation: thus it is neither regular, symmetrical, pleasing, nor sound.

ne copies from nature; he finds what is an accidental blemish in his proto-type, and he finishes his copy, from the more perfect details of some other example of the same species.

671. One of the most ludicrous ideas of imitation, that ever were proposed, was in a design for a public cemetery near Hampstead. There exist, it is well known, at Athens, the remains of a building, which from restricting circumstances, was a mass, consisting of three different small temples, each of a different design, irregularly blended, and each imperfect in itself, although having the most delightfully exquisite details: there can be no doubt, that if circumstances had permitted, the architect would have either built three distinct perfect temples, or would have blended together the three in a regular manner. But in the design for the cemetery, the building was proposed to be exactly imitated, with its occasional defects and all; but to keep to a sort of uniformity, another building was to have been erected opposite to it, with similar decorations, but with the irregularities reversed. This puts one in mind of that king, who, when he sat at table with his hump-backed wife, would always have on the other side of him, another hump-backed woman of similar figure, for the sake of uniformity.

CHAPTER LXXXI.

Of that wherein we Successfully in Modern Times Copy the Antique.

672. Of the ancient buildings, some have required more than twenty centuries, and some more than thirty centuries, to render them time-worn, and some of them have still after that repulsed the attack of time: but our modern buildings of even yesterday already seem old, and are crumbling, fractured, and decomposing: thus we imitate successfully the antique in decay, but without the same expense of labour, cost, and time.

CHAPTER LXXXII.

Of the Strange Public Disrepute, into which Grecian Architecture has Lately Fallen in England.

673. One of the strangest of all anomalies, is the disrepute, into which Grecian architecture has now run, after some years of the most extravagant panegyric, on the part of the English nation. One of the most frequent observations of the public, now is, "I must confess I do not like your Grecian architecture," and this, too, after the travels, the research, the labours, the splendid publications, and the efforts, of many of the most persevering, learned, and enlightened men, that perhaps the world ever contained. Really, the public and the profession, at no former period perhaps in the history of man, ever before possessed such treasures of accurate information, and correct and beautiful delineation, as the present various meritorious works on Grecian art: but as these have increased in value, Anglo-Grecian architecture has become debased in design and execution. Truly Grecian architecture may be said to be, in England, wretchedly unfortunate.

CHAPTER LXXXIII.

On Some Abuses in Anglo-Grecian Architecture.

674. Among the other desperate abuses, which bear down modern English architecture, may be noticed, the vice of making pilasters in width only half the diameter of the column, or even less than that.

The Greeks were in the habit of making the flank only of a pilaster, narrower than the proper width, in order to prevent such pilaster, when viewed angle-wise, from appearing greater in bulk than the circular columns, and in order that this blemish of artifice should not exhibit itself prominently, they made the improperly narrow return of the pilaster, project so little as scarcely to appear before the wall of the building; but they never deformed a principal front, by placing on it mutilated pilasters of this kind, and thereby giving to the building, an appearance of weakness at its angles: this defect shews the worse, as the pilasters must, of necessity, be of their full width on the side under the architrave. Another abuse, springing out of the last, is to flank a portico, with two huge masses of materials, divided each into two narrow pilasters some considerable distance apart, but projecting so little, as at but a very short distance to appear but one excessively clumsy and ill-shapen pilaster.

675. There is yet another abuse in the formation of pilasters, which is to let them project considerably before the face of the architrave, while the latter scarcely projects from the wall, the pilasters themselves appearing to support nothing: this is so absurd, that the author has heard it particularly remarked upon, and justly condemned, by even those who are not conversant with architecture.

676. For some of these abuses, a hint, it is true, may be found even in the buildings of Athens; but in those cases, they were the creatures of unavoidable circumstances, or were the irregularities resulting from the plans of the edifices being restricted by particular contracted sites; and it is a libellous unfairness, upon the chasteness and good taste of the Greeks, to blazon forth their unavoidable or inadvertent faults, rather than their virtues. These vices make the aspect of some of our best buildings, appear haggard and uncouth at a distance, and ill-proportioned at a nearer view.

The Parthenon, and the Temple of Theseus contain no such abuses: there is no severity which their accomplished architects would not have uttered against them.

CHAPTER LXXXIV.

Of the Causes which have Brought Grecian Architecture into Disrepute in England.

677. Observe in what the merits of Grecian Architecture consist.—*Uniformity of design; grandeur, neatness, and beauty of outline; bold expression of light and shade; delicacy of secondary ornament, on purpose for a near approach; profusion of exquisite sculptural figures in relief; and lastly, material fine in colour, and of nature durable in the climate in which the edifices were built.*

678. Now in England, all this is most usually reversed; and the uninformed, fancying what they see here erected, is real Grecian architecture, thence decry it, and naturally fancy those who launch forth into such high praise of Grecian art, are little gifted with taste or wisdom.

679. *Our Anglo-Grecian designs, are rarely uniform;* there is always sure to be some blemish about them: they mostly have the property, of appearing destitute of the most valuable of all qualities, viz. grandeur. The greater part of our modern Grecian buildings, from miscalculation, have a profusion of hideous excrescences above their columns and entablatures, that have a ragged, mean, and disagreeable appearance, totally destructive of that repose and that bold elegance, which are to be found in almost every ancient work, whether Egyptian, Grecian, Roman, Romanesque, Gothic, Arabian, or Indian.

680. *Few of our modern buildings, have any bold expression:* the bold shades, between the columns surrounding an ancient temple, can be observed at a prodigious distance; which to the beauty of outline adds even at that distance, picturesque enrichment; hence, although of general form so simple, the eye never tires, and the form never appears like a plain block. But our own modern structures, frequently being destitute of columns, and all other bold projections, at the shortest distance, appear mere rude heaps, without any adornment, notwithstanding considerable expense may have been incurred, in furnishing them with several ranges of microscopic enrichments, which totally vanish when you have placed yourself at a proper distance for taking a general view of a building. While the projections and recesses of ancient works, are frequently many feet, any projection or depth beyond a quarter of an inch, seems to be considered now, *una stravaganza;* nay, some instances are to be seen, of modern pilasters three or four feet wide, which were intended to project three sixteenths of an inch, but which, from a trifling inaccuracy of work, have retired in parts one sixteenth of an inch behind the adjoining brickwork.

681. *We do not have the friezes of our Grecian buildings, adorned with ranges of historical sculpture:* we have no representations of sacred history, ranging about the external and internal friezes and galleries of our churches. We have Chantrey, and Westmacott, and Behnes, Rossi, Sevier, and other sculptors of eminence, whose works well applied in such situations, would be an honour to the nation. Those eminent men, could give us the *spirit* of Grecian art, and of nature, adapted with elegant propriety to the situation, without the foolish mode of attempting to make a modern building, a mere museum of fragments of ancient art, *but such, as a man with the talents of Phidias, a Christian of the nineteenth century, would, by the purity and dignity of his imagination, produce.* But there are some of us so blinded to propriety of situation, that verily it is to be believed, we should glory in adorning a Christian church with mere copies of the figures, from the Parthenon at Athens. What would Phidias have said, if he had been commanded for the Parthenon to copy exactly, the sculptural records of some obsolete religion?

682. *But, how inferior are we in general to the ancients, in the materials of our buildings.* Marble is not demanded, for the exterior of an English building; it is here, the most costly, and the least durable, and therefore in this climate the least proper for use. But granite and Portland stone, *are* imperiously demanded: these, we possess in abundance; they are durable; and perhaps the latter kind, bleaches to a colour, finer than any material of which the ancients made use to any great extent. Greenwich Hospital, St. Paul's Cathedral, St. Martin's Church, the Horse-guards, Somerset House, the Post-office, and most of the buildings erected in London by Wren, are of this *precious material.* In many instances where the vertical joints of Portland-stone have been finely

wrought, they are scarcely visible; and though some of these buildings which are composed of it, have been erected 150 years, they are still in almost perfect condition.

683. Lastly, as if in England Grecian architecture were not brought sufficiently into disrepute, to the other indignities which it has already suffered is to be added (if some are to have their way) the art of "*Polychromy*." Without denying that bits of tinsel, or the oxides and stains of metal, may by industry over-curious, be found on some parts of ancient marbles, and that in some cases even a general overlay of paint may be found, and in others an ornamental pattern; the author fearlessly asserts that he believes the best architects of Greece and of Ionia were incapable of any thing so trifling: the soul of nobleness and of grandeur, which their sublime works exhibit, shews them to have been incapable of descending to such petty fopperies. The architects of the Parthenon would have been as much offended by the "Polychromic" defilement of their works, as would the great Chantrey, were one of his busts to be painted in colours and placed for a wig-block in a hair-dresser's shop.

684. If the bare finding of any thing, whatever it be, upon a Grecian building, is to prove it to form part of the original design, then will the celebrated doorway of the Erectheon be taken for part of the original fabric, although its ornaments in taste differ so much from those of the body of the temple, and are so inferior in style, that few moderns jealous of their honour would imitate them, however much they might admire the work generally.

685. It weighs with the author little, that some of the Germans, perhaps for want of opportunity for shining in great and original architectural research like the Stuarts of Britain, should attempt to build up the false art of *Poly-gewgawdery*. We can suffer some extravagance to be mingled with the fineness of intellect which the Germans possess; and for the sake of the genius which their romance, their drama, and their music exhibit, we can excuse them even when they approach the confines of insanity.

686. But with the Britons who have all the honour of Grecian research to themselves, no singularity, no un-historic assumptions are needed in order to gain a name in architectural literature: if the field which has been gone over by the British Dilettanti be not sufficiently wide, how much remains in Asia Minor yet unexplored? How much is there still left, the knowledge of which may exalt taste, while the fevered small-minded pursuit of "Polychromy" can only hasten in Britain the downfall of pretended Grecian art, from the inborn British preference of simple grandeur to gaudy little frippery. "Polychromy" may serve for the architecture of paper-hangings, and of theatrical scenery, in which it is found difficult by simple roughly-sketched *chiaro scuro* to do justice to the exquisite form and finish of Grecian art; but the first attempt to apply it to the exterior of any English building will be enough to banish it immediately from our soil.

687. If all the stains, the washings, the *super*-additions, the repairs, the mendings, the gildings, the colourings, the oxides remaining from mineral pigments, which during two or three thousand years may have been given to a building to hide its decays, to humour the fancy of a priest or an archon, to expend the contributions of liberal votaries, to give an air of new smartness in degenerate times to an old building erected during the purity of art, if these in despite of the silence of history (audible enough upon most other subjects of architecture), prove that Polychromy was a constant and necessary part of pure architecture, then may the gold, the blue, the red, the yellow, the lime-wash to be found in most of our parish churches, be with equal certainty proved to be the original inventions of the free-masons, and absolutely necessary to Christian

architecture. And with equally good ground may the loose white-wash, which a few years since was laid over the interior of St. Paul's Cathedral, at an expense which would have furnished all its choir-window with fine stained glass, be taken for the original work of Wren; then may the black stains in the interior of that edifice, which before the late colouring appeared like fine marble, be taken as evidences of Polychromy,—though with equal probability they may be considered as the august walls' disclaimer of the application, lest St. Paul, viewing his church, should say as he did to the high-priest, "Thou whited wall." If all that is to be found at the ruins of a building is to be taken in spite of chronology, and of whatever be its taste, as part of the original work, what field have we for false dogmatical assertions upon taste in nearly all our sacred edifices! the same kind of proof would show that the blocks of material composing the present front of the College of Surgeons, were placed there by George Dance,—him of the solid race, which built Shoreditch church and the Mansion-house, and who himself designed St. Luke's hospital, and the fronts of Newgate,—all of them, in spite of their faults, the most substantial and the finest of their kind. Nay, the small enrichments in a lower style of Athenian art, which have been added to the celebrated portico of the College of Surgeons, might by the same mode be proved to be Dance's own work. "*These pretended corrections do mischief. Edifices "should be left as originally built, whatever be their taste, or their want of taste: "they serve as histories, and enable us to confront and purify more and more the "tastes of succeeding times*."

Nay, Dance's work at the London Guildhall, set up when Gothic architecture was under a cloud, is by the same reasoning incontrovertibly part of the ancient hall; and the mixture of genius and of ignorance of the subject which that modern addition displays, will be referred surely to antiquity.

688. Little is wanted in England to bring Grecian architecture altogether under persecution and ban; and the art of "Polychromy," worked up out of the rust of bronze and iron, and from the impertinences of fallen art, will suffice for the fulfilment of that degradation.

689. Lovers of "Polychromy!" disclaim a pursuit which can never elevate architecture, and in which may be spent much of that precious time of which we have too little,—that time which may be employed in the endeavour to ennoble art and science, by original invention, by the philosophy of reason, and by such diving into the laws of nature, that architecture may, like the works of the creation, be founded at once on economy, convenience, and beauty: such pursuits may place your names among the greatest, while sacrificing solid and reasonable research for the tinsel and minced glare of "Polychromy," can only afford the reputation of *an useless architectural petit-maître*. The author once heard a naval surveyor propose to cover for beauty, preservation, and economy, the whole exterior of Somerset-house, with *black paint*. Surely this would not be thought barbarous, by those who insist that the marble walls and the "wooden walls" of Athens were alike bedizened.

690. There may be of the sublime, in the aspect of an ancient English castle-gate, with its high and broad flanking towers, with no "Polychromy," but that of Time dispensing lichen, moss, stone-crop, wall-flowers, and ivy, with a beauty of keeping man cannot imitate: but there can be nothing of the sublime in an Athenian Propylæa, however august in itself, the aspect of which is shred fine, tinseled and yelked, redded and purpled, by a man of a minced spirit, as if in emulation of the harlequin gaud of a show-booth.

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* Tomo i. p. 146. Queste pretese correzioni fanno rabbia. Si debbono lascia gli edifizj come sono stati architettati da' loro Autori, di qualunque gusto sieno, o di disgusto: servono di storia, e di confronto, e per depurare sempre più il gusto de' posteri.

CHAPTER LXXXV.

Of the Question, How Far the Modern Architect in Imitating Grecian Architecture, should Imitate the Grecian Structure of Buildings?

691. GRECIAN architecture, formed when art was in its purity, but when architectic science was in its early childhood, exhibits even far less skill than was requisite for the construction of the more massy Egyptian edifices.

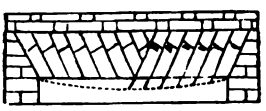
692. It is not to be supposed, that a people so shrewd and highly gifted as were the Greeks, in procuring and elevating a stone lintel of no great span, (and which would have broken with a comparatively small access of weight,) would have expended as much money and labour as would have procured a magnificent marble column, or a frieze the immortal work of Phidias, had they been acquainted in the time of Pericles with the arch.

693. Hardly can any person of common intellect deny that they would have used its strength and economy for the sustentation of many parts of their edifices.

694. It then becomes a serious question, whether a modern English architect should altogether banish from his edifices, the leading features of which are Grecian, all appearance of the arch. He will find few employers willing greatly to enhance the expense of an edifice, and greatly to enfeeble its structure, by the banishment of the arch: and yet he will hardly like, in a building, to mix up with it the decidedly Roman appearance of arches.

695. That the Greeks were not in the purest times of their architecture, averse to curvilinear forms, the Tholus of the Choragic Monument of Lysicrates, their mouldings and enrichments, the shafts and flutings of their columns, and the curvature of the Corinthian abacus, sufficiently prove.

696. And after all, the instances of the walls of Grecian buildings now remaining, and of any apertures in them, are so exceedingly few, that we indeed have scarcely any knowledge of the *general* manner in which the Greeks formed the heads of their ordinary doors and windows; we are as ignorant on the subject as a stranger coming two thousand years hence to England, and viewing the ruins of St. Paul's, would be of the existence of our gauged arches, or of the more perverse mode in which, in disparagement of skill, so many of our doors and windows are now covered.



697. The question is one of great difficulty; but in deciding against the use of arches, in imitation of Grecian architecture, we adopt that which is the most expensive and the least secure in structure. Even in the beautiful Church of St. Matthew, Brixton, the only one of our modern Churches which has any high pretension to the title of pure Grecian, the heads of the architraves of the fine and simply grand windows are sunk something, although joined in three pieces, probably with concealed arch-joints.

698. Some of our best modern architectural constructors (if not our best designers) have, in imitation of the curved form of the dome of the Choragic

Monument of Lysicrates, and the curved plan of the same edifice, and of the later Greco-roman edifices of Athens, boldly blended the safe, economical, useful, and elegant arching and vaulting of Roman architecture, with the correctness and purity of the details, columns, and entablatures, of Grecian architecture; in fact, they appear to have begun with Grecian architecture, what Palladio, San Micheli, Jones, Wren, and Chambers, effected with Roman architecture,—they retained its ornaments, but did what the Greeks themselves did with Egyptian architecture,—they bent it to their purpose: what was stubborn they reduced, what was inapplicable they omitted, what was needed they added.

699. The question is, in so doing, *did* the Greeks two thousand years ago, and *do* the moderns of the present day, offend thereby against taste? This question the author will not verbally answer; but he will go so far as to state, that he believes the Greeks were too refined to build other than according to the most advanced state of their science; farther, that he would not build a Cathedral of Grecian architecture, with either a flat ceiling, or with square-headed windows; and he rather thinks, to avoid the difficulty of anomaly, that he should adopt the finest examples of Roman Corinthian; and that in its decorations, he should mix sculptural imitations of the most beautiful examples of the animal and vegetable creation, wrought by our Chantreys, the favour of whose talents would be as much an honour to himself as to the nation.

CHAPTER LXXXVI.

Of the Inutility of the Porticos of Most Modern English Buildings.

700. The porticos of ancient temples, appear to have been erected, first, for dignity; and secondly, for the priests or the people to stand under, while the latter were not in general allowed to enter a sacred edifice.

701. In a climate, cold and rainy like that of England, and with the peculiar habits and religion of its inhabitants, gatherings of the people without doors are not frequent: thus one of the greatest uses of the portico of a modern English Church, Palace, or other public building, is to afford immediate shelter from the inclemencies of the weather, upon coming for entrance to the building, whether on foot, by horse, or by carriage: hence we find that the porticos of those modern buildings which upon state occasions should appear in their fullest and most perfect lustre, have at that time added to them for protection of the comers, wretched hovels of bed-ticking, or of rusty sheets of corrugated iron, or of canvass oil-cloth or rough weather-boarding.

702. No portico should, on any pretence whatever, be erected at the portal of a public building, without being of such ample dimensions as to admit through its lateral inter-columniations (and that without distorting them), the largest class of carriages, which should ascend by a very gentle acclivity behind the front columns, which would stand gracefully and simply upon a continuous zocle, stylobata, or pedestal; which disposition, in saving the columns of a portico from the anomaly of standing upon detached pedestals, as those of the Post-Office, London, would satisfy, in that particular, the most fastidious lover of pure Grecian architecture.

703. Carlton House, London, the work of the great Henry Holland, one of

the last of England's real architects, possessed a fine Corinthian portico of Portland stone, elaborately enriched, under which a carriage could drive: it was large, though not quite large enough to admit carriages without widening the lateral inter-columniations of it; but then the front of it was free from the vulgar un-symmetrical barbarism of having its central inter-columniation distended, and this more than atoned for any complaint of any petty fault; with its fine intrinsic columns, and its grand magnificent entablature, perhaps over enriched, it may be justly doubted, whether England ever possessed any other portico so fine. This seems to have made the age jealous of it as though out of season, it was too good for this century; the enemies of their country's glory in the arts, condemned it; its whole gorgeous masonry, which shewed that England had yet some carvers in stone left, disappeared, to make way for heaps of moulded mortar, and for gigantic overgrown attics, which trample beneath their feet plaster models of columns, as if columnar architecture were not in England already abased enough.

704. The columns of this portico, it is true, have re-appeared at the National Gallery, but then, broken by removal, and lying some years unappropriated, then reworked into meagreness, though placed in a situation where they are visible from a very great distance, and surmounted but by a low plain unenriched entablature, and no longer forming a shelter under which the carriages of princes, nobles, and freemen may drive, truly the once regal and useful portico of Carlton House, is no more. It was the only new work of architecture which George the Fourth produced out of his profuse expenditure in building materials.

CHAPTER LXXXVII.

On the Present German School of Architecture.

705. The present German school of architecture, is, take it altogether, entitled to very considerable praise; its works possess much grandeur of conception, much beauty of sculptural decoration in the very finest style of art, blended with considerable constructive science; we have in none of our own modern architecture, such exquisitely imaginative beauties: most of our modern buildings are bald and mean; some few of them possess correctness, but of even these, some appear colder still than the stone of which they are built; in some points, however, our buildings are very superior to any of those of the Germans; for amid the excellences of our foreign competitors' works, there is a rudeness, which is totally surprising; a certain blending of the very worst principles of the very worst Gothic, at total variance with the soaring beauties of their school, which rises, in some respects, beyond the works of the very Greeks themselves; without this dash of Tedesco corruption, their works would be too soaring, too ethereal, to be human; their designs seem to be the result of the two opposite principles resident in man; could we transfuse into our architecture the unpolluted classical and inventive beauties of the Germans, we should both warm it, and raise it; but we need only to copy the vices of the German school, to complete the ruin of our own diseased architecture.

CHAPTER LXXXVIII.

Of the Vice of Not Finishing Buildings as they were Originally Designed.

706. CERTAINLY another vice in modern English architecture, is the not finishing edifices as they were originally designed; true this is no new vice. St. Paul's Church escaped this, and is consequently the most complete large building ever erected; in this respect no other great Cathedral in the world can in any manner compete with it; St. Peter's at Rome may be something larger, it may *as yet* be internally more highly adorned, but altered as it was by many succeeding architects, increased in bulk but not in beauty, with an exceedingly defective and crazy façade which would never permit its intended campaniles to be reared, it fails in competition with our own beautiful Cathedral, which masses, and re-masses, pyramidizes in all its small masses, these uniting to form extended pyramids, and again the whole structure combining to form one mass spiring upwards into one grand pyramid of decoration; all shews the fashioning hand of a thorough master; while to its lovely outline, and decorative richness, it joins the lofty quality of the most profoundly skilful and scientific structure: though its astonishing bulk stands upon a quick-sand, it has fewer settlements and defects than perhaps any other great building in existence; so extended is its base, so nicely are its masses adjusted, so admirably are they poised, counter-poised, and tied together; those who are so half-witted, that they cannot admire the beautiful structures of the mid-ages, without disparaging all other works, both ancient and modern, will allege, that much material has been wasted by Wren in his great work; the author is of another opinion; he admires the construction of such works, he admires all their excellences, but he does not admire defects in *them*, or in *any other* buildings; it is the *excellence* of all buildings which he would admire; he doubts not, that Wren could have erected St. Paul's with one fourth part of the materials now used in it, and that, so as to last as long as any of the Gothic structures have endured; but it must be confessed, that many of them are frequently out of repair; Wren's object was to raise such masses, that for many, many ages, they should resist time, and storm, and almost earthquake; he formed his work, both to last, and to be worthy of lasting; such are its unearthly excellences, that we feel ashamed to complain, that it has order above order, that its columns are coupled, that it needs stained glass windows, that it has some faults of detail which cannot be defended: what work on earth is free from objections, which we find even against the works of Heaven? For many ages it will stand the finest living example, of unity, completeness, skilful design, and successful execution; its very faults, compared with the very beauties of most of our modern wild works, are chastened correctness; those who never saw it, know not its excellence; its graceful and picturesque outlines, composed of many intricate parts, never yet were correctly represented by the painter or the engraver.

707. It is certainly a tormenting thing, that Somerset House, the noble and superb work of Chambers, which is the only pile we have in London anything like a palace, it is a mortifying thing, that this should not have been completed, exactly as the excellent architect intended: not the slightest deviation should have been permitted under any pretence whatever; one thing is certain, that if King's College increase to a just extent, as there is no doubt it will, either it must be removed to a separate building, or the whole of Somerset Place must be yielded up to so good a purpose: then how absurd to change the order! Chambers was illustrious in his style, he was rarely equalled, and was never surpassed; he was besides a sagacious builder; the masonry of his work is all exquisite: then why change the order of architecture? It seems the eastern

wing of Somerset House, must not have the same order as the rest of the pile, but one the same as to the new private buildings in the Strand and about London Bridge : strange kind of unity.

708. Why was the front of the Custom-house altered ? true, the original front had a thousand faults, both of design and execution ; but amid its faults it possessed much grandeur. Why was it altered ? Why was the present scattered, mean, and ill-proportioned, portico, imitated from the mean wings of the building ? Why were the other alterations made ? true, the original Long-room had a faulty roof, without tie-beams, but it might have been re-built of the original form, with a proper roof; the former Long-room, had a good deal of second rate beauty, and great grandeur : the present Long-room, is tame and mean ; it contains nothing of genuine architecture ; the room has size, but no grandeur ; and the paltry elliptical ceiling over it, is a very sad successor of the former coffered domes ; before, the room wanted height amazingly, but now it altogether wants expression.

709. The alteration of an original design when once begun, is the greatest mark of self-sufficiency on the part of an architect ; it always causes immense injury ; and no good whatever, to any building, has ever resulted from it. This pernicious self-importance, is the true reason why we have such a number of odds and ends of buildings, but so few of them complete ; for this perhaps there will exist no cure, till the legislature shall pass an act, authorizing proceedings by a bill of pains and penalties, against any architect, who in future, shall alter the style of any unfinished public architectural work.

CHAPTER LXXXIX.

Of the Chaos in English Buildings from not following One Design ; and of the Littleness and Meanness which thence Result, even from the Most Extended Outlay.

710. Nothing in architecture is now done upon a grand scale ; nothing is now done according to one uniform design ; we have enough of building, but all remains a collection of littleness, not like those sands, which through time become rocks ; our sands remain sands.

711. That assemblage of pieces of buildings, lying between Charing Cross and Westminster Abbey, is the most forcible illustration of this ; many things begun, and hardly any thing complete, there is in this situation, enough of building, to have formed something grand, something wonderfully grand ; but such appears to have been the unfortunate perverseness of circumstances, that the whole is a mass of irregularity and misfortune ; it is true, the little existing crumb of White Hall Palace, shines like a dazzling gem, in spite of its having order above order, and mitred entablatures ; it has such masterly boldness, such simplicity yet such richness, such justness of proportion, and such a truly royal aspect, that it gives the lie to criticism, and if it have faults, makes one wish that we had more of such faulty architecture.

712. It is also true, that one cannot but admire the beautiful Corinthian order of the buildings erected by Sir John Soane, at the corner of Downing Street ; but then one is obliged to regret, that it is crushed by a heap of blocks and pedestals, which, if admitted at all to a building, are better employed in raising it out of the mud, than in crushing it down into it ; and one cannot but also regret, that its columns require to be of a larger size, in order to appear more dignified, less thin-set and scattered ; this latter fault, however, belongs to the north front of Somerset House, the work of a consummate master of proportion.

CHAPTER XC.

Of the Loss which the Architecture of England Suffers at the Present Day from the Hurry with which Edifices are Now Erected.

713. Another cause of the rapid decay of modern English edifices, of their inferiority, and of their extravagant expense, is the hurry with which many of them are erected.

Incited by what they see reared in worthless rapidity around them, few employers are now content to wait a sufficient time, for their architect to consider every part of an intended structure, to arrange its component details with exactness, to ascertain correctly the parts of the fabric which will need great strength,—to disburthen of weight, useless material, and consequent cost, those parts of the fabric which will have no sustaining duty to perform ; and then too, in the execution, the super-structure is reared before the foundation has come to a state of rest ; ceilings are formed before timbers have assumed by gravity and shrinkage their ultimate forms ; floors and joiners' work originally made of unseasoned materials, are still more swollen by the damp from the walls and plastering ; the wood-work painted while soddened, afterwards shrinks like the timber-work of the erection, and through the damp confined by plastering and paint, falls into the consumption of dry-rot ; and the whole fabric, though even it may have been built with some skill and science, is a mass, in its walls, its timbers, its joiners' work, and its plastering, of flaw, shrinkage, settlement, and dry-rot : if it be ever so plain a fabric, the cost of the mistakes, alterations, and misapplications of material, have swallowed up more than would have added elegant rational adornment without stint to a sound and praiseworthy structure, to which few repairs would afterwards have been necessary ; while time and gravity, would have more and more knit together and consolidated, through many an age of hoary fame, a fabric so formed in wisdom, in art, and the delicate refinement of a mind anxious to perform the most with the smallest means,—a mind, which looking over the whole design, could find out where, by reducing inert or destructive burthen, to obtain the funds for the delicate chisel, where by refusing the waste of shattered bricks, it could find payment for the honest mason, where by confining the plasterer to work which could last and yield him credit, he could discover wherewithal to obtain stone granite or even marble columns, which five hundred years hence might tell the observer, " This is the work of an honest, " skilful, and tasteful spirit," and cause him to demand, " But what were the " other boasted fabrics which tradition tells us stood beside this building ; are " all departed ? where is their stone ? where is their taste ? where is their sci- " ence ? have their fragments gone with Grecian marbles into museums ? are the " rising geniuses of modern schools, now occupied in drawing their lineaments ? " is the engraver multiplying beautiful representations of them ? does the anti- " quary now, through hours far beyond midnight, waste his health in composing " treatises upon their excellence ? do the learned dispute upon their situations, " and their several intended uses, and refer to them as illustrations of history, arts, " and manners ? have they caused a cessation in the invention of architecture ? " and is the whole world now occupied in reproducing them, in the materials " which are to be found from Greece to Caffraria, from Ireland to Carthay ? " have they in Kairo, or in the Thebes itself, stopped the eager traveller in his " pursuit of the wonders of Mitzraim ? has the Parker's cement of England, that " vanquisher of the sturdy quarry-men of Portland, and of the men of science of " London, become naturalized in Ham the land in which Jacob was a foreigner, " has it sealed up her quarries ? does the wandering Italian, transport to Botany " Bay, casts from cement casts which beautified, in their way, the once boasted " ' Metropolitan Improvements ? ' "

714. This worthless, senseless, flurry in building, fills our architecture with brutality and consumption. Now that our Church architecture is reduced to a bankrupt commission of scarcely two shillings in the pound upon what was formerly considered but decent, our un-church-like fanes are rendered still more mean and decrepid, by being finished before their unseasoned materials have dried and shrunken, and thus architecture grows worse and worse. While the very few hundreds of pounds which are now allowed for the erection of a modern English Church, demand that every farthing of the poor expenditure should be turned to good account, and that if possible wisdom should make up for parsimony, do we find this? till lately, at least two years were allowed for the erection of an ordinary Church; now we find such a structure completed in one; thus all seasoning of the timber, (see § 337.) all that motion and that subsidence which might take place before the plastering and ultimate completion of the fabric, now occur after the unsanctified hovel is opened; and the wretched work becomes a satire upon our excellent Church, and a laughing-stock to our architecture.

715. In private buildings for trade, besides the injury from rashness, inconsideration, useless burthen, and weakness where strength is required, the proprietor not unfrequently more than doubles the present outlay, from not forming any decided plan, from doing and undoing, from setting a crowd of men to appear doing something upon the premises—but standing more in each other's way than performing any absolute work: whereas the greater part of the work might be done more cheaply away. It is no uncommon thing for a small retail trader, to expend £1000. in cutting away the chimneys, and refitting in a coarse and vulgar way the lower story of a house, when more deliberation, but action still more rapid, might have done the work more soundly and more elegantly for £500. Were such an employer to be in the first instance told that he would expend £300. he would be amazed: but fancied rapidity, and fancied economy from rapidity, put him from the benefit of good marketing; he loses the advantage of contract; he pays the full price for materials which, were they seen before used, would be discarded; and he pays the full wages of good artificers, for men of whom many are hardly in ability beyond common tradeless labourers, and who, from being over numerous in one spot, prevent each other from action. Many a trader by such folly, to avoid the stoppage of his business for a week, will in his impatience waste the income of a whole year.

716. Some of the richest builders of London, have made their fortunes from the frauds resulting from this weak-mindedness; while a large proportion of those contractors who have built churches with integrity, have met with no reward but a debtors' prison.

CHAPTER XCI.

Of the Wisdom of the Ancient Architects and Old Masters in Proportioning their Architectural Ornaments to the Distance from which they were to be Viewed.

717. How wise was the proceeding of the ancient architects, in always making their ornaments of size proportioned to the distance from which they were to be viewed. The smaller and smaller a building is, the more delicate in proportion may be its ornaments; whereas if a building be very lofty, besides the increased dimensions, many parts require to be retrenched altogether, so that what remains may be distinct; for the eye hardly reaches in pure vision, through a mass of air, charged perhaps with vapour, to a great height, without such a device.

718. Thus, the colossal Corinthian order, round the dome of Saint Paul's Cathedral, being to be viewed from the ground at a great distance, has only

one row of leaves in its capitals, instead of two; but we have modern church campaniles, which have something wrought on their Corinthian capitals, but which the eye cannot make out, till on ascending to the roof of the church, and assisted by a telescope, it perceives that doves supply the place of volutes.

719. This very serious architectural error, renders and justly so, our modern works unpopular: the expense of that little sculpture, which a proud but mean age allows us, is thrown away; nay, more, it makes our works appear confused and crumbling, rather than decorated.

720. All the works of every age, which have become celebrated, have a grand boldness in their conformation: so nature, in forming her noblest countenances, always does it by making some feature prominent.

721. At the present day, when have fallen into disuse architectural sculpture, and nearly all those rustications, projections, bold decorations, and other legitimate devices, which (when classical architecture was successfully worked up to meet the religious and domestic wants of Christians, in habits and opinions far different from the accomplished ancients,) gave richness to that which would otherwise have remained through necessity merely plain walling, columns sometimes being either not required or absolutely obstructive and inconvenient, nothing else has supplied the loss of the various well-proportioned and well applied ornaments, which in some way or other always rendered buildings formerly agreeable; though indeed we sometimes find a cornice thirty feet from the ground, with mouldings but an inch or two in height, delicately enriched, while close to the ground, by a perverse change, a range of honeysuckle-flowers, by floricultural exaggeration swollen to an altitude of three feet, is placed as a balustrade between columns eight inches or a foot diameter.

CHAPTER XCII.

Of Beauty of Outline in Buildings; of the Inferiority of the Moderns, Compared in This Respect with the Ancient Masters; and of the Inutility of Decoration, Without Goodness of Outline.

722. But that for which the ancient masters are so eminently superior to the modern architects, is elegance of outline: almost every one of the old buildings, however exceptionable in point of details, has a grand, a neat, and a picturesque outline. The Gothic steeples of all countries, the dome of Saint Paul's, and the bell-towers of Wren, and numerous other old buildings both in England and abroad, whether viewed from afar or near, they all have almost universally, an imposing and agreeable appearance; their considerate architects, seem at once to have designed the elegant outward shells of buildings, so as to contain amply all the internal requisites, without unsightly additions; or if from any necessity, enlargement of a pile afterwards became necessary, the picturesque massing and grouping together of the buildings was never lost sight of.

723. But what is the mode now pursued? In most instances very different. A debased exterior copy of some old building, is made on a small scale, in base materials; this pretended economical crust, in nine cases out of ten, is discovered eventually, to be neither high enough, long enough, nor broad enough, to contain properly all the accommodations and internal details of the building: hence

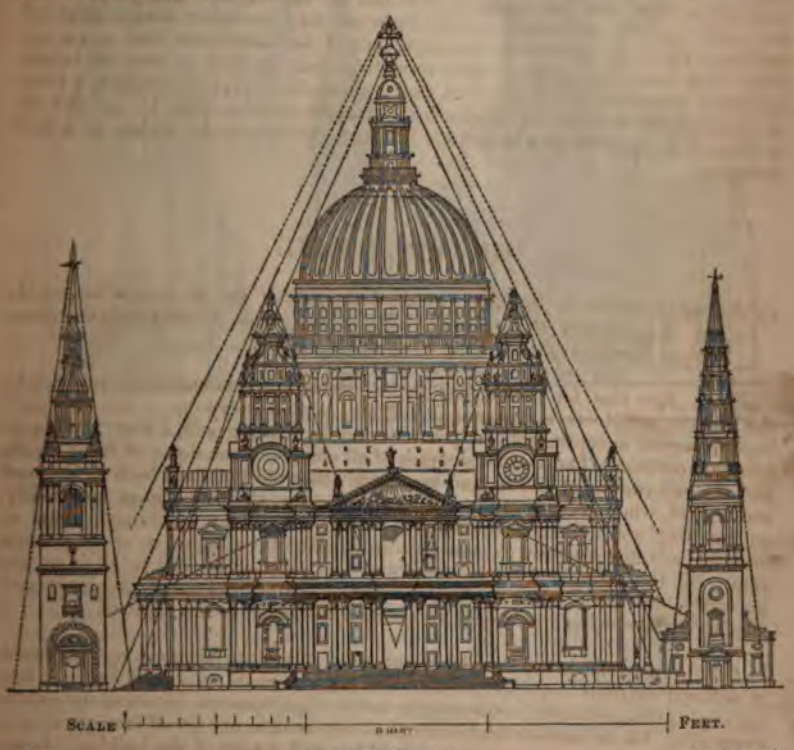
are added the external incumbrances of lantern-lights, ugly dormers, chimneys, and other deforming excrescences, for which modern buildings are so celebrated.

724. Nature, always contrives to place every necessary apparatus, within the compass of the general outline ; but most modern buildings, exhibit the same contrivance, as birds would, if their giblets being omitted within, were afterwards skewered upon their backs.

725. If a building at a distance, appear ugly, it is in vain that it have delicate enrichments, and that it be composed of rich materials ; it cannot please either the vulgar or the tasteful, nor can the scientific give it commendation.

726. The qualities of form and outline, stand apart from all the petty quarrels about orders and styles, by which unskilful professors have pestered and lowered a once-noble art.

727. The most picturesque edifices of all countries, have a wonderful similarity in their outline. The most perfect architectural composition is that which forms one immense Pyramid of Decoration consisting of many minor subservient pyramidal masses :—such are the celebrated Indo-moslem Tombs of Akbar at Secundra, Shere Sha at Sosseram, Humaioon at Delhi, and the Tâj Mahal at Agra: such are St. Paul's Cathedral, the steeples of St- Mary-le-Bow, St. Bride's, and those of all the others of Wren's churches.



Bow Steeple. St. Paul's Facade. St. Bride's Steeple.

The same principle is to be found governing all Gothic steeples.

SALISBURY. ST. PETER'S, CAEN. FREIBOURG.

CHAPTER XCII.

The same delicate and refined principle pervades Gothic turrets and moslem minarets.

Four great angle turrets of King's College Chapel, Cambridge.

Shaking minarets of the Mosque at Armedabad.

728. While upon the subject of outline, the author cannot refrain from contradicting, as far as in him lies, the opinion put forth with regard to spires by Mr. Britton, in his exquisite work upon "*The History and Antiquities of the Cathedral "Church of Salisbury*," (p. 74). "Although this spire is an object of popular and "scientific curiosity, it cannot be properly regarded as beautiful or elegant, either "in itself, or as a member of the edifice to which it belongs. A May pole or a "poplar tree, a pyramid or a plain single column, can never satisfy the eye of an "artist, or be viewed with pleasure by the man of taste. Either may be a beau-"tiful accessory, or be pleasing in association with other forms. The tall thin "spire is also far from being an elegant object. Divest it of its ornamental bands, "crockets, and pinnacles, it will be tasteless and formal, as we may see exempli-"fied in the pitiful obelisk in the centre of Queen Square, Bath; but associate it "with proportionate pinnacles, or other appropriate forms, and like the spire of "St. Mary's Church in Oxford, and that of the south-western tower of Peter-"borough Cathedral, we are then gratified."

Very odd reasoning this, and quite at variance with the in-born feelings of nearly every native of Christian lands. The author would have deemed it unnecessary to refute such a passage if it had been put forth by any other than an antiquarian gentleman to whose taste and perseverance we owe so much.

729. By the denuding process mentioned by Mr. Britton, every thing accounted beautiful in the world might be rendered both uncouth and ugly: thus, take away the features of the finest head and face, you have remaining a raw skull: take away the sauce garniture and cookery of a feast, and you leave but crude flesh, raw vegetables, and a few other things equally untempting.

730. The builders of the Christian steeples, those outward beacons of a religious country, so caught from the true sublime one of the chords holding mastership over the human heart and feelings, that the tottering child and the snowy-headed old man, the religionist and the scoffer, the churchman and the sectarian, alike pay the tribute of admiration to the beauty of form of the Church spires built by our forefathers on principles the mechanism of which, perhaps, they cannot understand, and from feelings, which though some of them cannot possess, yet cannot but revere.

731. But the truth is, the myriads of these glorious outward church adornments which told at every step the alien as he came to Europe, in this land Christ is great, now deemed useless though sublime, employed industriously and profitably that portion of our Christian population which from the want of employment now begs or tenants the workhouse and the gaol.

No object exists more sublime than the steeple of St. Peter's Church at Caen, unless it be that of St. Michael's Church at Coventry,—none more sublime than St. Michael's, unless it be that of Louth,—none more sublime than Louth, unless it be that of Chichester Cathedral,—none more sublime than the steeple of Chichester Cathedral, unless it be that of Antwerp Cathedral,—none more so than Antwerp steeple, unless it be that of Strasbourg Cathedral,—none more so than Strasbourg steeple, unless it be that of Freibourg in the Breisgau,—none more sublime than Freibourg steeple, unless it be that of Salisbury Cathedral, which tapering up to heaven in beauteous proportion till it seems more lofty than it really is, appears as though it had drawn down the very angels to work over its grand and feeling simplicity the gems and embroidery of Paradise itself; and, indeed, the most gorgeous of the English florid works of architecture always retain such a peculiar character of sacredness that they always unfold a truly religious appearance.

732. The pyramid is Nature's own form; her mountains, the grandest of earthly masses, diminish to heaven; architectural science requires that a building to endure should end in a pointed summit: a mere heap of sand will by its own gravity assume a pyramidal form, and so endure for thousands of years, and long outlive a wall of granite reared perpendicularly.

733. The feeling of love for the scientific and picturesque form of the pyramid is so inherent in man, that any modern steeple which is erected, is immediately universally condemned if its outline be not strictly pyramidal, and the most illiterate, who knows not why he condemns it, is strictly correct in his condemnation.

CHAPTER XCII.

734. A pyramidal outline is of such importance, that if even a dome do not conform to it, ungraceful clumsiness, and disgust to every class of beholders, are the sure results. In this may be seen the wonderful art of Wren, in proportioning the dome of St. Paul's Cathedral. The cupola is placed a great distance within the tambour, so as at once to suit the particular scheme of its construction, and to form a pyramid. *De Quincy* says it appears very harmonious, notwithstanding this peculiarity ; but the truth is, that the perfection of its form emanates from this diminution. Indeed, many of the modern cupolas built by Sir John Soane and others, being almost as large in diameter as their tambours, show as little mastery of the picturesque as of construction, and violating the principles of *natural* taste, have become so unpopular as to have obtained for themselves the cognomen of " Pepper-boxes ;" and the same title, but too often applies to bad copies of the ogive domes of King's College Chapel, from their not being built with the graceful and spiring elegance of their proto-types.

(Outline of St. Paul's Cupola.)

735. The principle of the picturesque in architecture, absolutely requires that if a mass have not a plain square outline, it should appear to be hewn out of an exact pyramidal or conical block.

736. The principle appears to have been first discovered in Egypt, and to have spread over all nations from China to the farthest extremity of Europe.

The same principle pervades the Egyptian pyramid, the Egyptian needle, and those vast moles of masonry which ascend to an enormous elevation before the Egyptian temples : it pervades the Grecian and the Roman Temple, the Athenian Choragic monument, the Pagoda of China, the mysterious edifices of Mexico, the temple of ancient Hindoostan, the Mosque and the Tomb of the Moslem, and the Christian steeple.

737. The Greeks, whose several states were inconsiderable, and therefore incapable of raising such ample funds as powerful kingdoms like ancient Egypt or modern Britain, never erected buildings which were not small and low ; most of their edifices, therefore, not breaking above the general altitude of their dwellings, they did not require that strict attention to perfect pyramidal outline which was always attended to in the lofty buildings of other nations. They made no advances whatever in the more lofty departments of science which were requisite, and which were of necessity called into use in the construction of such gigantic edifices, they contented themselves with a mere triangular façade.

738. Both Greeks and Romans, however, appear to have been well aware of the upward diminution requisite in order to correct the otherwise overhanging appearance of the upper part of a building, whether from optical illusion, or from the projection of a cornice ; hence we find many of their finest edifices were formed with the plain faces of their architraves receding, as if to continue the upward diminution of their columns. But the proper display of sculpture in the Frieze of an order, in general forbade that member to recede, except in small buildings, such as the Choragic monuments of Lysicrates and Thrasyllus, which were fully taken into the eye at one view. Of the following ancient

buildings the faces of the architraves recede : at Athens, the Parthenon, the temples of Theseus and Erectheus, and the arch of Adrian,—at Salonica, the "Incantada,"—at Rome, the external and internal orders of the Pantheon, the temples of Jupiter-Tonans and Bacchus, the reputed frontispiece of Nero, the reputed temple of Pallas in the forum of Nerva, the arch of Constantine, and the Ionic and Composite orders of the Coliseum ; at Tivoli, the reputed Temple of Vesta : all these examples show the possession of the same knowledge, but different degrees of skill in making use of it ; and there is at Agrigentum a remarkable monument, shown by Mr. Wilkins in his "Magna Græcia," the order, entablature, and other members of which, all converge upwardly in a very peculiar manner, not altogether unlike some of the spires of Norman architecture, as at Rochester Cathedral. This structure is reputed to be the tomb of Theron, Tyrant of Agrigentum.

739. In buildings to be viewed from a great distance, the great art consists in making them appear pleasing from every point of view. Wren was in this as great a master as in geometry and construction : not only do his steeples bear the test in a front view ; but when viewed diagonally and in various other ways they still conform to pyramidal outlines whether passed down their utmost breadth, or through the distended open parts of them which appear in a side view.

Diagonal outline of the spire of St. Dunstan's in the East, London.

How ill the moderns have succeeded in steeple building by piling one discordant heap upon another, may be gathered from the almost universal contempt with which the architect, the architectural critic, and the public in general, view our modern steeples : to raise upon each other, to coarse broken outlines, imitations of delicate small works of ancient architecture which stood on the ground, cannot satisfy the mind or the eye : these things all require to be designed on purpose : the higher the stages of the work ascend they are more and more restricted in general magnitude by the outlines of the pyramid, yet from their superior altitude they require to be designed in a larger and simpler style, otherwise, not being read by the eye, they become confused and thence tasteless. The steeple of the new church at Shadwell, from being formed with a good outline, has received almost general praise, although its details are coarse and its materials are mean and fragile : the easy labour of drawing two pencil boundary lines, meeting at its summit, gained for its designer this praise, and saved him from the reprehension given to many works, the details of which would rank higher if placed in proper situations. The author always knew that good steeples were formed on this principle, and he has been much pleased by finding the boundary lines remaining in pencil upon ancient drawings of them.

CHAPTER XCIII.

Of how, from the Neglecting of Architectural Modelling, the Picturesque Forms of Buildings are Injured; Of the Incapability of the greater part of mankind to judge of the Probable Effect of an Intended Building from drawings alone; and of the Impositions which are frequently practised in the Pictorial Effect of Drawings, from not representing Buildings of the proposed Materials, and with the Outlines and General Perspective Appearances which they will absolutely assume.

740. Another principal source of the ungracious aspects of many of our modern fabrics, is the almost total disuse of general models of them. Persons unacquainted with architecture, are unable to foresee the effects which will result from a design of which drawings only are produced: old practitioners are themselves frequently deceived in this manner. Small as may be the acquaintance of the judges with the subject, few perhaps would be the occasions in which they would adopt the external forms of buildings as they are erected, did they see them previously in models. Scarcely can the most accomplished professor of architecture know thoroughly the effect which will be produced by an intended building except from a model of it, and without the fabric be of very simple general form.

741. The model of an intended building should neither be small nor highly finished: for the meanest building reduced to the petty dimensions of an ordinary model, and with all its details shewn, is apt to distract the attention of the uninformed judge from the form and picturesque merit of the design, to the delicate skill of the model-maker: delicacy may be indulged in in the model of a building *already* erected; for if the building be really good, no delicacy of modelling can do it sufficient justice; the finest model can but in the most imperfect manner, represent the sculptural graces of an accomplished work. The object of the model of an intended work, is the preservation of the work itself from gross errors, while a small model can afford no instruction whatever for the design and workmanship of the minute ornaments of it.

742. Of late years perspective drawing has been made almost to supersede architectural modelling; and as used, it has become an art more pernicious than useful.

743. A model shows at once the bad points of a design; but in a perspective drawing, such as usually made, the best aspect is chosen, every thing disagreeable is lowered or concealed; every thing calculated to make a picture is elevated and made prominent; irregularities are corrected; proportions are improved; brick, or stone, or plaster, receives from the colour-box the same brilliant complexion; thus that which an ordinary judge has supposed would be grand, picturesque, and beautiful, turns out mean, harsh in outline, and disappointing.

744. If the design for the new Church at Pimlico had been properly modelled before the work was executed, it is not probable that the outlines of its turret would have been in most views so harsh; when near and in front of the Church, the appearance is not unpleasing: as you take a diagonal view, elegance disappears; but when you arrive at distance sufficient to lose the minute details of the work, a diagonal view of the turret presents a broadish, plain, unpicturesque heap, surmounted but by a very small superstructure, which is altogether insufficient to fill out the outlines in a satisfactory manner.

745. Because models were made use of to ensure picturesque grace to our old buildings, is the reason why no artist, even by his best efforts, ever did them complete justice in his delineations: artistic effort is now, on account of this relaxation, absolutely requisite to palliate the demerits of our architecture. A few shillings bestowed in modelling the general form of each of our new Churches, would have saved them from a world of the harshest criticisms.

CHAPTER XCIV.

Of Architectural Drawing; and how Neglecting other Branches of Knowledge neither makes a good Artist, nor a good Architect.

746. THERE is no small boasting at the present day of architectural drawing. An architect cannot draw too well; but when he obtains much practice, he will find, that besides designing the form and the details of his works, he has little time for drawing; in general, he has as little time for making the clean and fair copies of his drawings as the sculptor has for the stone-cutting department of his art: while if he cannot design, and is unacquainted with the other many branches of knowledge which he should possess, he should cease to call himself an architect.

747. In making drawing his sole study, (but with the interruptions which business will naturally bring) the pupil becomes only a bad artist, and no architect at all. The pernicious folly of imagining that he who can make an architectural drawing must of necessity be able to make an architectural building, has wrought largely towards the ruin of real architecture, and has tended more than any thing else to fill our metropolis and other places with white-washed, and even stone ruins, which the weak have mistaken for architecture, and has led to that general disregard to structural propriety which is the besetting sin of modern works.

748. The pernicious sentiments which place so high a value upon design, and so low a value upon execution, are not confined to England; Antoine Rondelet in his "*Essai Historique sur le Pont de Rialto*," says, "Les projets seuls "procurent souvent les plus beaux titres de gloire, et l'exécution ajoute peu à "l'honneur de celui qui a obtenu la préférence." (p. iii.) Notwithstanding this, had Palladio built nothing, and had Jones not erected the Banqueting House,

they would have been little heard of. But in truth the mere drawing does not form the design; ingenuity and invention may be called for in a thousand ways in order to create a building, and yet the mere draughtsman may be destitute of them both.

749. Now that the architectural student too frequently misspends his time in endeavouring to imitate the painter in drawing those human figures which he but very rarely arrives to execute well, he rises to the representation of a sky before he knows how to form a roof beneath it,—most of his time is lost in the stiff and mannered copying of ancient buildings, without going into their structure: he produces a world of schemes for nothings, which he knows will never be executed, because nothing that he has done is natural, and suited to the purpose; there is no freshness about it. His time is too often spent in the rapid reproduction of useless copies (partly changed and partly injured) from former examples, and he learns little else than to draw badly in a cold, a stiffened, an expired art. He calls this taste; but finding that the mass of the people are not awakened to admiration by it, he complains of their ignorance and brutality. Now the time spent in learning to draw badly, a work without truth, without philosophy, without art, without structural excellence, without geometrical ground-work, without adaptation to its purpose, without real beauty either abstract or obvious, this time so misemployed might have been successfully employed by him (were architectural education such as it should be) in, by the age of twenty-five or thirty years at the utmost, learning thoroughly all the known arts of trussing, of roofing, of vaulting, of doming, of forming arches, pyramids, and all other parts of architecture in structural perfection: this safe ground-work with the necessary growth of mind, expansion of power, freedom of ability, would lead the professing architect to soar aloft over all the chained spirits who fancy a few water-colours alone can raise them above San Micheli and Palladio, above Wren and Chambers; they know they cannot surpass Raffaello and Buonarotti in drawing, yet they do not consider that they might with ease surpass them both in architectural design and construction; thus they choose that competition in which they cannot succeed, and neglect the one in which they might gain an easy victory. They might be the first of architects, but they choose rather to be last of artists: instead of gazing with an astonished ignorance upon ancient buildings, they might as much surpass them as the science of the moderns surpasses that of the ancients.

750. Nor are our public institutions altogether free from blame with regard to the nature of architectural drawing: instead of sending their members to scour the country for accurate delineations of the forms and constructive anatomy of buildings, ancient and modern, to furnish which, students would esteem a kind of glory, and accurate engravings from which would be purchased with avidity, and become of the greatest utility to society,—there is too often a petty competition raised for a petty prize between young men who have then as yet imbibed none of the elements of constructive architecture, some of whom from disappointment absolutely break down and never afterwards flourish as architects, though they may be endued with caution, patience, integrity, invention, ingenuity, and all the qualities from which alone good architecture ever resulted: we are thus chiefly left for our delineations of Gothic and other architecture to the artist by profession, who though he may generally succeed in pictorial effect better than the architectural draughtsman, yet from want of technical knowledge, rarely affords us that accuracy and that structural minuteness which the practitioner requires. We even have to suffer from the antiquary the taunt of having done nothing towards the revival of Pointed Architecture, and of having rather depressed it by the meanness and inaccuracy of modern imitations of it. It would take our public institutions but few years to afford us all the information which we need, but the efforts of their pupils and retainers being chiefly confined to external forms and

admeasurements, they obtain little more information upon the subject, than would the anatomist from measuring the skins of animals, or from merely drawing their external appearance.

CHAPTER XCV.

Of the Disuse of Symmetry in Modern Architecture, and how the very Original Signification of the word "Symmetry" seems to be lost to Architecture.

751. CORRESPONDENCE of dimensions in the arrangement and parts of buildings, affords that charm which forms the brightest jewel in the architecture of the ancients of all countries and of all ages, but it is that perfection which we least frequently find in the works of the moderns. Now there is always some absurd excuse or other which leads the modern practitioner to ruin the aspect of his buildings by rendering them unsymmetrical.

752. How awfully noble was the symmetry of the Egyptian buildings: what delicate agreement was there in the parts of a Grecian temple, with its columns of equal dimensions, with no petty deviations, with none of that *dogged* aspect which we find in most of the colonnades of the moderns, as if beauty consisted in irregularity: what perfect symmetry is there in the exquisite Choragic Monument of Lysicrates: how beautiful is a Gothic Cathedral with its repetitions of arches, vaultings, ribs, pinnacles, and other decorations.

753. This symmetry is the greatest of all the outward perfections which God has given to his works. The very insects which we thoughtlessly consider the meanest, and crush to death, are formed with a thousand times more symmetry than the most costly work of man; no flower that grows wild, not a weed that is trampled upon, is without the most exquisite symmetry.

754. Symmetry (true symmetry) does not consist in a wearisome repetition of the same minute ornaments throughout a building; this *pseudo* symmetry is peculiar to the modern pauper architecture of England. No, nature after she has symmetrically formed and sketched out her general figures, fills up the work with such wonderful variety, that the anatomist, the botanist, the natural philosopher, may sometimes spend a whole life, and with the strongest magnifying power scarcely discover all the graces and perfections of one single subject or specimen of research.

755. The Egyptians, Greeks, Romans, and Mid-eval architects, all imitated nature in this; their buildings charmed by their symmetry at the first view, and on nearer examination they afforded to the mind a feast of delight in searching the beauties of their sculptural ornaments, whether of figures, foliage, or other exquisite details.

756. How altered is now the adornment of our buildings: very few of them have symmetry; and the eye cast in a trice over the bald and uninteresting fabric, leaves it in discontent and desires no further search.

757. The Egyptian, awe-struck with the un-earthly grandeur of the works on the banks of the Nile, could spend hours, days, weeks, perhaps months and years, in exploring their countless hieroglyphics.

CHAPTER XCV.

758. The Greeks never tired of reading the sculptured fables or theological histories which ranged round their august temples: they offered to their imagined deities, the unblemished sacrifice of such design and workmanship, as after thousands of years remains unparalleled, and is still deemed by men of a far different faith as the most precious sacrifice which could have been offered by the worshipper from his handy-works.

759. Again, where is to be found the mind which does not delight still to linger upon the rich mental feast which almost all our glorious Christian Cathedrals afford? Where is to be found the coarse and un-curious spirit, which after it has a thousand and a thousand times explored their elaborate and changeful beauties, (surely the emanation of inspiration) desires not again and again to return, to admire, to imbibe, and were it possible to re-produce their charms.

760. The symmetry which the Greeks so profoundly understood, not only consisted in making things of corresponding dimensions, but in making things *appear* of corresponding dimensions, by correcting those optical deceptions which make objects appear unsymmetrical. The Greeks knew well that illusion by which things of parallel widths appear larger at top than at bottom, and like the skilful musician, who, by the apparent irregularity of flats and sharps, renders his melody perfect, they disguised the seeming imperfection; they knew that a parallel pilaster-shaft surmounted by a far-projecting capital, would appear to diminish downwardly, as may be seen in some of the "Metropolitan Improvements" formed since the decline of symmetry; they therefore gave the capital, a very small projection, and insensibly diminished the shaft, only enough to make its sides appear upright: the same love of symmetry taught the Greeks how to give a column its true "*entasis*" so as not to appear swelling, but to prevent the projections of its base and capital from making it seem pinched in with a waist in its middle; the same love of the symmetry of effect, taught the Greeks to make the angular columns of a temple thicker than the others, because, when viewed diagonally, they are more exposed to the reduction of apparent size by the atmosphere than are the other columns: and the same love induced them to make the internal ranges of columns of a temple of a lighter proportion, because they were scarcely seen except from confined situations, from whence they must always appear colossal.

761. We have now few edifices erected with that goodly, that debonnaire aspect, which makes the mind at once feel a charm; few will copy the perfect symmetry of the inter-columniations of the Parthenon, but thousands will imitate the irregular disposition of the columns of the Propylæa to the Acropolis of Athens, where it is evident that the architect struggled in vain with a gigantic Doric order which could not be enslaved willingly, and which refused to become symmetrical, its columns appearing in the elevation as if set in a circle.

762. There is another kind of symmetry which requires that there should be some appearance of proportion between the inside and the outside of a building; in violation of this, we sometimes at the present day find the interior of a building adorned with ranges of large and massy columns, while the outside of it perhaps possesses only a couple of small and mean columns, and those rendered still meaner by being ill treated in some of the modes in use in the worst times of Rome, or in the worst style of modern Italy.

CHAPTER XCVI.

Of Chronological Symmetry in Architecture.

763. THERE is a symmetry of chronology in architecture. The mind of refinement relishes not in imitations of former works, that the tastes of those of different ages should be huddled together. The man of education can never believe but that such confusion emanates from ignorance, or from what is still worse, from bad taste indulged in in spite of knowledge. We have in the Metropolis many remarkable instances of this vice in attempts at Gothic architecture, more particularly in the confusion of arches of different ages. This condemnation of chronological confusion in architecture, is not the offspring of whim or pedantry. One who never saw any architecture, would, if he ever built at all, be free from this mixture, he would commit no error against chronological symmetry.

764. If a man neglected chronological symmetry in order to combine in one building all the structural improvements of successive ages, his work would rank very high in the scale of philosophy ; but for one instance of the slightest approach to this, we have a thousand in which the irregularity has been fallen into simply on the score of pleasing an eye gifted, it is pretended, with the picturesque, but which a mind of delicacy and refinement esteems much more lowly. And in such violations, we most frequently see a direct offence committed against common stability. He who is least learned and least experienced, offends oftenest and worst against chronological symmetry. Few but the most refined are uncontaminated in this respect ; and in proportion to the carefulness and richness of his education, does a man abhor such a mixture ; such a man is very ill-satisfied when he sees a copy of the Choragic Monument of Lysicrates, an Athenian building of a very early age and in a very delicate style, placed with modernisms as a turret over a modern Italian Doric portico with columns of cast-iron, as at the Chapel near Waterloo place, London ; he is little more satisfied when he sees Athenian edifices of far different styles and ages appropriated to the same building, and piled upon each other, whether in the body of the fabric or in a steeple, as at the new Church of St. Pancras, London ; he is still more dissatisfied, when he sees copied in England a group of Italian buildings consisting of a bell-tower of very early mid-eval architecture, perhaps of the time of the Saracen influx or earlier, mixed with other buildings, some of the age of Palladio, and with others of the time of Borromini. The man of a delicate mind cannot flutter from the frowning and stupendous Gothic campanile, imitated seven or eight feet square, to the small revived classical colonnade, and from thence to the curled and broken pediment.

765. No man can gain repute from commencing a building with Grecian columns, carrying it up with Roman arches, and finishing it with the bad style of modern Italy, or surmounting that again with something still worse, of modern England. None of these compounds can obtain lasting repute : they may be valued by the careless, the ignorant, or the gross, but their value will have the duration only of a dream.

766. To keep to one style in Gothic architecture as to generals is easy enough, yet it is that fault into which the actual fabricators of our buildings oftenest fall ; but to carry them through with appropriate details in every part, which is as it were the delicate syntax of architectural grammar, is that at which very few of us are apt ; yet the refined antiquary who is well informed on this subject, fails not to call us to a severe account ; and he proves but too truly that

many of us, after we have done building, should commence architectural education anew.

767. All the best men in architecture have kept to one style, except in some few pieces performed before their styles were fixed ; and none of them ever admitted a mixture of styles in the same building ; for the largest human work appears but small ; and to cut a building into the wrecks of different ages, never can increase its apparent size ; the works of the Greek and Roman architects, and those of Palladio, Jones, Wren, and Chambers, are as unmixed in their way as they could be.

768. No person of architectural refinement, and known to be a master of his art, was ever heard to commend mere transition styles ; though he may study such styles in order to become a proficient in the history and chronology of his art.

769. The very young practitioner may at first delight in them as in toys, which, as he grows up in art and science, he throws away ; he may be pleased to find that with little thought, less study, and still less skill, he can please those less learned in the matter than himself ; but his mere self-esteem will gradually lead him to value less and less such praise, and to seek in a chastened philosophical practice of architecture, such a repute as loss of personal friends, and the wearing out of time, cannot deprive him of ; the first is a sensual architect : the fame of the other may survive many ages the records of his frailties ; the first, works for the lust of the eye,—the other, deems himself successless, if by the powers of his mind he cannot claim the admiration of the wisest of posterity.

CHAPTER XCVII.

Of Second-hand Architecture.

770. We moderns lie under the charge of being second-hand architects ; those who make this charge, would have accused the Romans of being second-hand architects too, because they adopted orders from the Greeks, with nominally every member the same as in Greek architecture, though so different from it in profile and proportion.

771. But wherein does second-handness in architecture consist? If I adop and copy any former work for some modern purpose for which it is inconvenient my architecture is second-hand ; it is like a tarnished suit of clothes, which is too wide or too narrow, too long or too short, for its new patron.

772. If I place a distorted portico where there should be a gateway, because the Greeks, not understanding the arching of large gateways, were obliged to put up with an inconvenient and distorted colonnade, my architecture is second-hand indeed ; the Greeks seized the best which they could obtain, I seize the worst, though I pay the highest price for it.

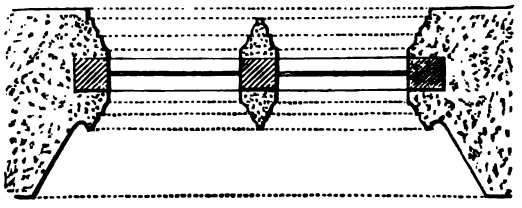
773. If I, out of squeamish affectation, will not for some useful purpose perforate the back of a portico with windows, because the Greeks and Romans, not understanding the use of glass for windows, mostly avoided such perforations, my architecture is very second-hand. I still adopt an old garment which does

not suit the wearer. The Greeks and Romans, even in their mild climates, were judges too good to have remained in dark holes, or in open sheds, if they had understood the art of fabricating cheap window-glass.

774. If I pretend to imitate Italian architecture, and raise to a common house a sham *campanile*, and thereby waste as much expense as would change all the stucco of the rest of the fabric into fair, good, and durable stone, besides crushing in the foundation of the building, and sinning against that admirable perfect uniformity, and that symmetry, which nature adopts in all her works, whether flower, beast, bird, fish, insect, or reptile, my architecture is second-hand; it is an useless and dead imitation: if indeed a fine prospect were to be obtained, I should have reason for erecting a lofty tower, it would cease then to be second-hand.

775. If I blindly copy in a new fabric, Elizabethan, or any other debased impure transition or mixed ornaments, I go to the architectural Monmouth Street, I desire only frippery, I have no relish for the choice in art.

776. If I write any inscriptions in or about a building in Gothic characters, as the Creed, the ten Commandments, or the Dominical Prayer, I still shew a love for the second-hand. The Greeks, the Romans, the Etruscans, the Gothic architects, wrote on their buildings always in the character best understood at the time; if I write in an obsolete mode, I do not imitate my wiser predecessors. But, perhaps, I pretend to be an antiquarian: I only pretend to be so. The antiquarian brings to light things ancient, whereas I would throw the obscurity of antiquity over things modern.



777. If when I adopt Pointed Architecture in domestic buildings, I disdain upon every occasion the superior comfort and convenience of sashes hung with lines and weights in cased frames, because our forefathers had not then invented these additions to the health and comfort of mankind, my architecture is wilfully second-hand: for by dividing each mullion into two, I may place the sashes between the two halves, and thus preserve both the beauty of the ancient mullions and tracery, and the superior comfort of modern windows.

778. If I send to a distance for red bricks to build an edifice with because some old buildings of red bricks remain in the neighbourhood, or because I may have seen red bricks used in places where none others were to be obtained, my architecture is still *second-hand*. I adopt at an increased expense that which is disagreeable to those whose taste is usually considered the most delicate; I set up that which persons of a weak eye-sight cannot view, whereas I should allure, if possible, the admiration of every class of beholders. My taste is as questionable as if I were to patch an old edifice of red bricks with yellow or with white bricks.

779. If I adopt in my new buildings casts or ornaments of former buildings scrupulously copied, and without relation to the subject, all this is *second-hand*. Ornaments in architecture should mostly be re-designed with propriety to the occasion, but without corruption. If I use in a private house copies from the Elgin marbles, I do not reckon them as part of the architecture, but as pictures, subjects of a museum; or if I use them as parts of the architecture, it is merely

to save the expense of original designs. The work is not valued by any one, for it is merely a very cheap copy of that which I have not invented.

780. If in a new building I imitate the timber houses of antiquity in the same kind of material, I have a relish of the very worst kind for the *second-hand*. Out of the most wretched affectation, I adopt a dearer material, and one which will burn and rot.

781. If I am building in the wilds of America, where standing timber is accounted a nuisance, I have just excuse on the score of economy ; I save the expense of carrying away the timber, and I save the total expense of other materials : I may therefore be allowed to use wood, till the country becoming civilized, wood becomes scarce, quarries are opened, and brick-fields are established.

782. If because I can find in soft climates a sort of varnish over the pores of rough stone, I fancy I have an unlimited licence for the use of external stucco, in a climate which in two or three years exchanges the polish of white marble for loose sand, while Grecian marbles two or three thousand years old retain their surface, I adopt the *second-hand* in the most reprehensible manner.

783. *Second-handness* in architecture is the pecular folly of modern England : it is wasteful pedantry of the worst kind : it leads men to prefer things unstable, inconvenient, and tasteless,—for taste has always relation to the age, the climate, and the destination. Neither the Egyptians, the Greeks, the Romans, the Arabs, nor the Free-masons, put up with the slightest portion of inconvenience, and yet all their works are tasteful in the highest degree ; they would have thought it no more reasonable to adopt things merely on the score of antiquity, than the modern mechanician would, under a pretence of keeping to primitive purity, refuse to adopt the improvements in steam-engines by James Watt.

CHAPTER XCVIII.

Of the Grandeur and Excellence of the Architectural Works of England, erected in times when she was believed to be poor, weak, and barbarous.

784. While England was an isolated kingdom of comparatively small extent, while it was yet oft embroiled in contest with its northern neighbours the Scots, still its whole land was rapidly covered over with the most magnificent buildings, castles, monasteries, Churches, and Cathedrals ; almost the oldest of these still remain, either in sound condition, or in obstinate ruins violently thrown down. Now that England has become a mighty empire, larger with its dependences than was perhaps any former empire,—now that it draws to its bosom the gold of all the earth,—instead of its buildings increasing in richness and grandeur, almost everything of its modern architecture has become mean, weak, tasteless, crumbling, unsubstantial, and an abortion of ugliness ; built in modern times, we have but the glorious Cathedral of Saint Paul, and a comparatively few other buildings ; if we talk of any other English work of grandeur beauty and delicacy, it was built three, four, five, six, seven, or almost eight centuries ago, when England was *poor !* and *weak !* and *barbarous !*

785. We have in modern times, steam-engines, and rail-roads, and steam-vessels, and a thousand private comforts ; but all that makes travelling in England delightful, all that is worth entering steam-vessels for, and journeys by rail-roads,

all was *formed by our barbarous ancestors*; they have left it us all; we have done almost nothing for ourselves in beautifying the land, except to form roads to view their works: had they not done so, it would have been still a mere desert.

786. If any one enter a town in England, the mind passes in disdain the dapper red brick or yellow brick square house of the doctor or the lawyer; it is uneasy till it has discovered the ancient Gothic Church; it rests upon *that* with delight; the heart aches to see the spoil which has been made upon the once fair fabric during the last three hundred years; the arches that have been dismantled, the windows that have lost their elegant mullions and tracery; the heart groans while it discovers how the water-tables and battlements have been torn down, and have been barbarously replaced with red shapeless masses by the local bricklayer; yet still some pleasure rises in the mind at even the small remains of ancient taste and beauty; a broken pinnacle, a panelled and foliated buttress, a capital still sharp as when first sculptured, a few crockets and finials not yet crumbled quite away, a portion of a "*purfled*" battlement still remaining, an escutcheon not yet quite erased, here and there a patchwork of gorgeously teinted glass, worked up among the modern glazing, and perhaps a richly carved beam, or the tabernacle-work of a baronial tomb elaborated with the perfection of masonic cunning, and once inlaid with engraven brass,—all these, fallen, degraded, crumbling, as they are, give a painful enjoyment to the mind, which it cannot feel amid the starved baldness and meanness of modern architecture.

787. The truth is, the ancient *barbarian* thought nothing too good to devote to his God, but was himself contented with the plainest fare; but the modern freeman, while he pretends that the plainest temple is most agreeable to Deity, thinks no luxury too extravagant for his own enjoyment.

CHAPTER XCIX.

The Inferiority of Modern English Architecture Proved from its Unsuccessful Mimic Nature.

788. The great proof of the vast inferiority of most modern English architecture is the bad success of it resulting from its mimic nature. There are very few indeed of our modern structures, which by the consent and acknowledgment of every one, even of their designers and executers, might not have been executed in a form and in a manner much improved. How different is this from almost all ancient works!

789. Thus of the reputed temple of Vesta at Tivoli, no one could have designed columns containing a more beautiful union of the robust and the delicate, of simplicity and richness, of lightness and solidity; no one could alter a single proportion so as to improve the design; no one could dispose the circular peristylium with more grace and symmetry; the addition or the retrenchment of a single member would injure the composition; so of the Parthenon; symmetry, grace, simplicity, elegance, richness, sculptural perfection, massiness, brilliancy of light and depth of shade,—any change would bring injury: so of the Choragic Monument of Lysicrates, uniform and graceful, a precious *Bijou* in art, a toy fit for an angel, the multitudinous base parodies in every possible manner of this exquisite composition all prove the superior value of the original work: so of most of the other clas-

sical buildings; fine proportion, every perfection of design and of skilful execution,—art could perform no more; any advancement would have led to a descent: —so of the Egyptian buildings, all are excellent; all are in keeping; symmetrical, soul-riveting, and in structure formed almost to survive the wreck of the world: —so the countless myriads of works of Gothic or Pointed architecture; few, very few, very few indeed of them, do not contain in a single edifice more variety (yet under one keeping) than all the race of Grecian, of Roman, and of Egyptian buildings; thousands of them go beyond all others in symmetry and elaboration; few of them are not thoroughly and perfectly finished, except where political or other causes have stopped their work, or have occasioned them to be carried on in a style somewhat different, yet often with increased richness, elaboration, and cost; the structure of most of them is excellent; and even those of them which, from local difficulties, are built of mean and perishable materials, are raised with such art and wisdom, that they are in structure even more stable than many works formed of the hardest and of the most costly materials: few buildings of Pointed Architecture are not most highly finished; not a wish can arise for the further embellishment of them; they form an eager feast for the mind of the most cultivated refinement; the heart lingers over them; the spirit is rapt into other times, and into other places, by the appearance of them.

790. But what are the best of the major part of modern buildings? Have we a copy of a temple, no columns has it at its sides: perhaps only a meagre *Facciata* in paper-like relief is spread over the front; its architect would build it of granite or of Portland stone, but it is of plaster; he would embellish it with the sculpture of vivid nature by Chantrey, but he is obliged to be contented with the handy work of the plaster image-maker.

791. Is it of the sublime Doric order, he consorts his Triglyphs alternately with vulgar glazed casements, which illuminate some vile mezzanine or lumber-room, some broom-store or pot-closet, which may be better placed in some other part of the premises.

792. Is it a copy of a Christian Cathedral or other Church, its stone vaultings are made of plaster, its oaken beams are of the same composition buffed over to appear intrinsic; no shrine-work, no canopies, no pinnacles, no flying buttresses, no rich tracery, no Scripture histories in stained glass, make it appear a rich offering worthy of a people privately richer than most that ever existed before.

793. Would he have his building uniform, some untoward circumstance prevents it; would he have his columns at equal distances, he finds it impossible; would he have them at such a distance apart that they can be reasonably supposed to bear their entablature, he cannot have them so; and that very entablature is made of so weak a description of stone, that it breaks by its own mere weight.

794. In fine, of almost all our modern buildings they want uniformity, they want proportion; they want, or height, or breadth, or adaptation, or propriety, or goodness of structure, or goodness of materials; hardly will the best modern buildings rank either for structural goodness, or for propriety of design, with the very worst of the ancient buildings, whether of the Egyptians, the Greeks, the Sicilians, the Romans, the Mahometans, or the Mid-eval Christians.

CHAPTER C.

Of the Misfortune which Falls with Peculiar Weight upon Most Modern "Improvements."

795. Not the least of the misfortunes or degradations of modern times fall with peculiar weight upon modern English architectural public undertakings, deemed "*Improvements*;" these form, with very few exceptions, one unvaried history of abortions. Whoever has had any thing to do with committees, cannot but have been more or less sensibly grieved at the petty jealousies, the injudicious interferences, which at once paralyze all excellence, while they commonly enhance the cost in an amazing degree; no one is able to command, yet no one will appoint a noble and disinterested Cincinnatus, who has mind to plan, and courage and ability to execute. Thus our bad, irregular, ugly, and unfinished works, are produced at costs much greater than would attend the execution of the most magnificent projects of a Jones, a Wren, or an Evelyn. The opportunities of producing splendour, beauty, and usefulness united, in our costly public works, are thus wholly lost.

796. From this misfortune, the new street from the Mansion House to London Bridge is insufficient in width, and is degrading to the heart of the substantial and wealthy city within which it lies, from its flimsy materials, which will perish before the fine buildings (built in generous and intrinsic times) within view of it, bear the appearance of being a single day older,—before Venice has assumed from age, another wrinkle. Twenty years will reduce its mastic to detached powder.*

797. But that which more than even the fragile materials of this avenue, and the sketchy and visionary nature of its architecture, concerns this lamentation, is the *direction* of the street.

798. The citizens of London are keenly awake to their own honour, and to the honour of their city, and well may they be proud of the *grand column* which lies nearly opposite the centre of the street; and taste and feeling, one would have thought, would have immediately suggested that the *Monument* should form the termination of a Vista, such as would no where else in the world have been to be found: but no, the axis of the street deviates considerably from the fine object; and the greater part of the grand work is basely obscured by offensively intervening tenements, which ought never to have been erected. The day will come when the citizens will in indignation order the demolition of these, and then the avenue, perhaps reconstructed, will afford one of the finest Vistas in the world: the author always thought this should be the case, and that some public monument also should be erected at the end of the avenue next the Mansion House; and it is with unfeigned satisfaction that he learns that a bronze equestrian statue of the Duke of Wellington is to be there placed, and that too by the great Chantrey: it should be raised into as much importance as possible.

799. Another most remarkable instance is the Regent Street, London. This collection of crazy odds and ends, which has been termed the Plaisterer's Pattern-card, was writhed like a serpent to lead to Carlton House; but no sooner was the costly work completed, than the stone object of its writhings was annihilated, and the ground upon which it stood let out for the reception of plastered sham buildings.

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* This process has already exhibited itself in an assurance office opposite St. Mary Woolnoth's Church.

800. In England, and in London particularly, this age stands apart from all others for the vain boasts of its architecture, but for its real immeasurable inferiority.

801. The buildings of the Indians, of the Egyptians, of the Greeks, of the Sicilians, of the Romans, of the mid-eval Christians, of the Normans, of the Mexicans, of the Arabs, of the mid-eval Italians, and of all civilized Europe, Asia, and Africa, they are all built with one almost universal structural excellence: their materials are all such, as in their several climates and situations, the greatest wisdom and the greatest knowledge would choose.

802. But now here, in a climate under which the hardest stone is scarcely more durable than in softer climates is the softest stone; nothing is used but quickly-decomposing stone, or mere mortar, or cements still more rapidly decaying than mortar. The history of the architecture of all other nations and of all other ages, can have no other instance drawn from it of a similar folly: we stalk in pride over Vitruvius, and Palladio, and Jones, and Wren, and Chambers, but we shall be trampled into dust by the architects who shall fifty years hence succeed us; such a system of rottenness will they find, that an indignant re-action will guarantee the then next hundred years at least from any similar decline of art and practice.

803. But that the decline of art and science in architecture does not properly spring from the age, its manners, and its meanness, may be proved from the immense number of edifices which, either by law, or through benevolence, or for the purposes of public business, are erected in every parish of England; these are frequently less in want of sumptuousness of expense than of arrangement. Were these properly arranged for convenience, as they should be in one mass, in the centre of the most populous part of each parish,—a Court, consisting of Church, Vestry-hall, Rectory-house, Work-house, National School, Sunday School, Infants' School, Grammar School, Sexton's house, Beadle's house, Parish Clerk's house, and Alms houses,—the boasted grandeur of Egypt, Greece, Rome, India, Mexico, would sink into insignificance before the 12,000 such grand establishments in England alone.

CHAPTER CI.

An Examination of the Alleged Immense Improvements in the Architecture of the Metropolis.

804. Let us now examine into the truth of the alleged immense improvements in the architecture of the Metropolis.

805. It has already been seen, that although it is possible that there is now in the world as much general and practical science at the command of the builder as there ever was at any former period, and in some particular departments a great deal more of it, that with some exceptions the art of building, as actually practised in England, and particularly in its metropolis, is from various causes in a condition much lower than it ever was at any former period.

806. It must be granted, that if in mere *building* there should be a degree of excellence, *that* description of building, which is dignified with the name of *Architecture*, should possess a superior degree of excellence, and that *that* which is not good building cannot be good architecture.

807. We have already seen that the Egyptians, the Greeks, the Romans, the Free-masons, and such men as Wren, in the integrity of their glorious labours, were incapable of separating good building from good architecture: these all knew that none but one who drew and knit together in the most secure, wise, and elegant manner, the best, the most chosen materials, by *advancing* (not *retrograding*) science, was entitled to the name of an Architect, or *Chief* CON-*structor*. None of these great men, who without arrogant pretensions, could create and furnish subjects for the pencil and graving-tool of the artist for thousands of subsequent years, would ever have admitted into their rank the mere copying-draughtsman-of-forms, who neither knows how, nor cares how, to *construct in solid and durable fabric*. But they would rather have called such a person as piles up gravel or cement a chief *ex*-structor, or chief *de*-structor. If instead of imitating in their durable works, the gravitating fabrics of that GREATER ARCHITECT who "made the round world so sure that it cannot be moved," they had used the modern process of *ex*-cretion instead of the ancient process of *con*-cretion, hardly would tradition have handed to us one wreck of the works now so fine, so many centuries old, and some of which are without flaw to this day; and much less should we have enjoyed the instructive luxury of graphic representations of them.

808. In the observations which are to follow, our modern bridges are to be specially excepted, for these form by themselves a class of constructions, which, were they the work of architects, would, for their science and structure, almost make up for all the defects of modern architecture.

809. If I take a general survey of the metropolis in any direction, what is there in the view which we owe to the last half century of wonderful improvement?

810. I can scarcely go in it from the presence of the goodly cupola of St. Paul's,—do we owe that to it? Bow Steeple, St. Bride's, St. Vedast's, St. Michael's Paternoster, the goodly front of Somerset House, the picturesque groups of monastic and palatal buildings of Westminster, every thing in London which is brilliant in aspect and fine in outline, every thing which really renders London in its general views by far the most picturesque city in the world—has not been built within the last fifty years.

811. If in the view I behold any thing which has a harsh outline, a rusty aspect, *that* I am sure is a modern work. If gas chimneys, and the ungainly roofs of theatres, form picturesque beauties, then do we owe much to the last twenty years of metropolitan activity.

812. If I go into the interior of this great city, I am still less satisfied. If I look for porticos with an odd number of columns, or supports, or with the ill-arrangement of differing distances, or set so far apart as to let their entablatures sink,—if I look for perforated friezes,—if for unfeeling mixtures of differing styles of differing ages,—if for the various other abuses which the best writers upon architecture, of all parties, have deprecated,—if I can find any of these things in works formed fifty years ago, I find them a hundred-fold more frequently in subsequent works.

813. It is in vain to tell me of Club-houses lately erected, I know only two or three of them which are formed of stone. Crockford's is so, of soft stone, and that is cracking as though it were built of cement. It is in vain to tell me of the vast improvement of substituting for a Surgeon's Hall of brick, one of gravel, a material which would receive no delicacy of workmanship in agreement with its celebrated portico, and which has had the super-addition of enrichments in a

small style after the lower class of Grecian exemplars, which only make the new work appear the more coarse and sullen.

814. If to build be to construct strongly, none of these things are buildings, —they cannot therefore be architecture.

815. Again, in the way of destruction, what do we owe to the last twenty years? Buckingham House, Carlton Palace, (the superb intrinsic work of the Corinthian order, in Portland Stone, of the great Henry Holland, an architect indeed,) these are gone.

816. The half mile of the elegant parapets of Blackfriars Bridge, by the most culpable of all violations, is now disappearing.

817. Almost in the outskirts of London, the celebrated Wanstead House has come to a violent end, and its magnificent Corinthian portico of Portland stone is destroyed.

818. How many fine old mansions, with their carved work, have given place to vulgar cemented tenements, with no cunning of workmanship, no picturesque effect, not exhibiting, on the part of their formers, any humanity, any beauty of spirit, any feelings of delicacy!

819. Coming to London from the East, does the new Church at Stratford, with its ruptured walls, its severed porch, and its plastered spire, shew any advancement in art and science?

820. Does the new St. John's Church at Hackney shew vast improvement in architecture? Did the numerous settlements in its walls, lately repaired, prove its erection to be superior, though of solid brick and Portland stone, to the now-isolated tower of the former ancient Church?

821. Passing to the minor Church in Well Street, Hackney, do the low falling walls of this indicate the improvement of modern architecture? From thence to the new Church at Bethnal Green, by Sir John Soane, is that an architectural triumph*? Do the spoils of the portico of Wanstead House, lying in a builder's yard at Cambridge Heath, shew the active improvements in art? From thence to Shoreditch; is the superb Church, erected there by the elder Dance, outdone by the edifice at Haggerstone, lately copied by Nash from the stupendous and exquisitely finished tower at Boston in Lincolnshire?

822. Again, do the *débris* of the fine portico of Surbiton House, Kingston, designed by Lapage, after that of the Erectheon, and delicately executed in Portland stone by Spiller the mason, and now lying amid old building-materials in a yard in the Curtain Road; do these indicate how architecture is in this age favoured?

823. Is the new Church in Skinner Street, Bishopsgate, much of a triumph over the old Church of Bishopsgate by Wren, and over that of Spitalfields, within view of it, by Hawksmoor, with a gigantic exterior, and the most superb interior?

* The author has been told that Sir John Soane wished to raise a circular Peristylium over the tower of the new Church of Bethnal Green, and offered to give £100 towards the work, but the requisite additional funds could not be raised, and thus the odd and squat fabric remains perhaps the most uncouth building which has been for many years raised in London. If the residuary legatees of the deceased rich architect possess any respect for his memory, they will rescue it from the discredit of a work, while remaining in an unfinished state, so unpicturesque and barbarous.

824. Going forward to the city—is the City of London Tavern, with its mud-coloured exterior, and its mock showy interior, much of an improvement upon the opposite old London Tavern ?

825. From thence right through the cities of London and Westminster—where are the boasted improvements either in design or structure ? Was the new Custom House, in design or structure, better than the former Custom House, or than the East India House ? Are our modern fronts of coarse gravel, or of oxidized cement, so vastly superior to the fine street-front of Somerset House, with its palatal adornments, and its exquisite carvings of river-gods ? Who speaks up for the wonders of the architecture of Buckingham Palace ? has this pile one friend to speak in its praise ?

826. Grecian Doric columns, surmounted by the lower class of the later Roman, and the fallen class of modern Italian arches, pediments and graceless wrecks of better styles—do these mark the wonderful strides which architecture has made in the nineteenth century ?

827. Again, looking merely to *soundness* of structure ; issuing from the Middlesex County Sessions House, and observing all the way from the falling broken front of the new Chemist's shop on Clerkenwell Green, quite to Hyde Park Corner, where there are four-score settlements and more in one public structure erected from charity funds—what heaps of broken cement, gravel, concrete,—what thousands, tens of thousands, and hundreds of thousands, of broken arches ! If modern architecture be driven from its assertion of purity by being convicted of harbouring an unwholesome fondness for those particular diseases in it which were cast off long ago,—if it be driven from these, will it take its triumphant stand upon the soundness of it, while convicted of these eternal breaches? Will it receive its character for superiority from the broken-backed porticos of the Regent's Park ? Will it prove its claim to ability in construction from the broken window-heads of St. Katharine's Hospital, or from those of St. Mark's Church, Clerkenwell ? Will the new buildings at Hyde Park Corner prove that we have learned to surpass our ancestors in the choice of stone from our finest quarries ? Will they give us any lights upon the construction of stone architraves? Can we learn from their intercolumniations the true "*Eustylos*" whether for beauty or for construction ?

828. Will the instances here mentioned, be in times to come, sought out, delineated, copied ? Will they become classical in art when England's glory is set, when her fair estates have been severed by earthquakes, when her rivers filled up with sand welter over her now richly cultivated plains, when her parks and her gardens are deserts ? Will the wanderer from Transatlantic regions, and from Australia, come to measure and delineate the London architecture of the nineteenth century ? When the last particles of the celebrated remains of Rome, Athens, and of Kairo, have mingled with the earth, or have been wafted away insensibly in the winds, will these be sought out as the only pure types in art ? If these questions can be answered with the most remote degree of probability, then boast of the wonders of modern English art ; till then, let modesty draw a veil over them, and strive to produce worthier things.

CHAPTER CII.

Of the Fallen State of Church Architecture.

829. If, with the Church of England, Church architecture be in a fallen state, much more so is it with almost all denominations of Dissenters.

Thank God, our Churches possess still some goodness of construction, and some taste ; or, if they possess little of these properties, they are possessed in an infinitely less degree by the modern buildings of the Church's enemies.

830. Upon the Church-reformers cannot be laid all the burthen of destroying Church architecture : already had refinement upon refinement destroyed its former sublimity ; from Italy, the very core of Popery, had emanated an amalgamation of uncongenial forms, which rapidly destroyed the integrity of the glorious and highly scientific Pointed Architecture of the North : it is true that England, the most remote of the Papal slaves, retained its Church architectural beauty longer than any other country ; it blazed here with grandeur, design, and curious delicacy, long after it had become polluted in other countries ; and it so continued in splendour till within a very few years of its final downfall.

831. The proceedings of the Church commission of England, form in many respects, a model of wisdom; the efforts of it have only been cramped by the want of a supply of funds so liberal as its important functions demanded : as its funds diminished, so of necessity diminished its liberality ; at first 20,000*l.* were granted for a Church, then 15,000*l.*, then 10,000*l.*, then 5,000*l.*, and after that even less.

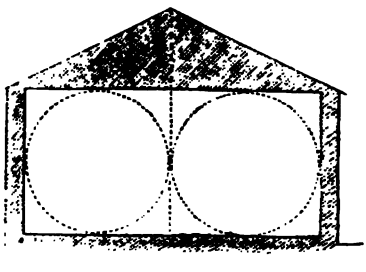
832. With the Church of England, indeed, may it be said, first began the revival of Church architecture : we look confidently to it for a thorough restoration of it ; besides, to such men as the illustrious John Britton, and his associates, we are indebted in no small degree to ordained Church-men, for a redevelopment of its principles : the publications of Milner, Bentham, Dallaway, Haggitt, Miller, Willis, and Whewel, are all works of great discrimination, and some of them are of very rare merit : the day, it is to be hoped, will come, *when Church architecture will become a part of College education ;* this would do more towards the careful support and restoration of our old Churches, through the awakened taste and feeling of our Clergy, than perhaps any other mode which could be adopted ; and perhaps, from his eminent situation, the parochial incumbent would have sufficient influence to prevent any manifestly bad design for a new Church from being carried into execution.

833. When it is considered how fallen was the state of Church architecture at the time when the Church commission began its labours, it cannot be wondered at, that many of the designs for the new Churches are very exceptionable, and in details, such as make one regret that they ever were carried into execution : indeed, how could it be otherwise ? No architect then living on earth understood either the theory or the practice of Ecclesiastical architecture ; scarcely any architect now living, who has arrived at the age of fifty years, ever received any lessons from his master in Gothic architecture ; indeed, when *his* master was himself a pupil, scarcely was there existing in the world a single correct graphic work upon the subject ; and even now, that literature is so rich in works of the desired kind, twenty years of hard study scarcely suffice to store the mind with those beautiful detached principles which hitherto no one has been able, successfully and completely, to develop in any elementary work.

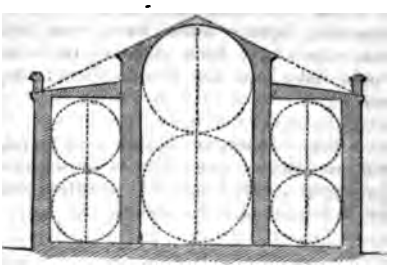
But now, with funds sufficiently liberal to preserve the work from meanness and fragile construction, we may confidently trust to the talents and correct judgment of several professors, who, had they lived in the mid-ages when good opportunity was not wanting, would have each become very illustrious in his career.

834. Very deep regret must be caused in the minds of all lovers of architecture, who are jealous of their country's honour, who are sincerely attached to our national religion, and who hold an in-born sense of its excellence and dignity, by the meanness, instability, and inaccuracy of almost all the present race of over-cheap Churches. In proportion as Church architecture has become better understood, from the diminution of funds it has become worse and worse instead of better and better; hence those best qualified for the management of our Church architecture have gradually resigned the field to men of inferior skill and knowledge: thus to poverty of expenditure is added not only inferior structure, but inferiority of taste, notwithstanding our improved knowledge of Pointed Architecture, so that we lose that unblended correctness and that soundness which are the more necessary from our architecture being deprived of the embellishments which wealth can afford; we are even threatened in the city, where the style and dimensions should be alike lofty, with the ghost of Wren's Churches, (not their geometry, masonry, and decorations) mingled in the expenditure of some two or three thousand pounds only, inartificially with the *contadinesco* of Italian farm-buildings. We have even an attempted revival of the Saxon, or Romanesque style, in sham Church architecture, but without its solidity and curious ornaments,—bald ugliness, flimsiness, and perhaps the anachronism of joiners' work deformed by the disagreeable draped panels which arose from the union of the *cinque cento* with the declined Gothic, making up for the historic value and the intrinsicness of the true Romanesque work.

835. It is to be sincerely hoped, since so noble a subscription has been raised for increasing the Church accommodation of the growing metropolis, that its managers will pause before they dissipate such a fund by raising mean and crazy fabrics. Should such fabrics be raised, without ample strength, of mean and perishable materials, and without ample endowments, they will form, as it were, so many apples of discord in the several parishes in which they may be implanted; for as in some instances of existing Churches in London, every time repair is needed to them, obscure disputes will arise, rights will be questioned, dissent will be stirred up, and refusal of repair will be sometimes triumphantly carried by those who deem every Church an eye-sore. If, instead of being eager to multiply Churches suddenly by the employment at once of the whole capital, the interest only of it be employed, without dissipation, in rooting firmly to the soil, and endowing, in perpetuity, sound and respectable fabrics, instead of imitating the Dissenters' evil policy of multiplying frail edifices, which are in constant need of repair, in thirty years more will have been performed something, nothing will have to be done again, and the whole fund will remain for increased efforts. In their construction, not one atom of external stucco, not one particle of soft stone, should be employed, nor should their roofs contain even the slightest portion of combustible material: not one of them,—except those of the smallest description, should be built without a clear-story. Perhaps some of them may be sixty feet wide, and only thirty feet high at their eaves; such fabrics, if covered with roofs,



in one span, must ever appear barbarous: the rise of the roof, which will be at least fifteen feet, will be lost to the internal capacity of the fabric, whereas, by forming it in three spans, the central compartment rising to the very summit of the roof, the internal section of the building, instead of appearing like a double square laid on its side, will exhibit a chief central compartment perhaps only twenty-two feet wide and forty-four feet high, viz. equal to a double square set on its end, and each side compartment like a double square set in the same manner.



836. The following remarks upon Church architecture are by a man of information upon the subject more than ordinary:—

"It was not the object of the architects or authors of these Gothic buildings "merely to strike the senses with what is externally grand and beautiful: we "must recollect that there are two kinds of feelings to be satisfied. What is "beautiful or charming to the eye may not always be so to the understanding. "Gothic Architects did not neglect those beauties which strike the spectator "with ideas of grandeur, with dignity, and with awe: their works possess those "qualities in an eminent degree: but they did not stop here; they meant to "satisfy, and (if I may so speak) even satiate the beholder's mind with the in-"trinsic merit, the richness, the finished excellence, of every, the smallest, the "most minute, and most hidden part of what they executed. They appear to "have courted scrutiny and investigation. They seem to have wished that "their works should, in some measure, resemble those of nature, which continue "to unfold new beauties and new miracles, the more and the more closely they "are examined. They abhorred the very idea of any thing like deception or "imposture in their buildings; and would have discarded with contempt, and "almost with horror, when they were erecting a temple to the Deity, the stucco, "the artificial marble, the plaster walls, and all those substitutes, which we now "employ and admire, and which are intended to look something like that they "are not.

"They would have considered them as only fit for the decoration and con-"struction of a theatre, where we expect not any thing that is real or substantial. "They meant, in a word, that their Churches should not only be striking and "beautiful, and grand, and solemn; but also rich and expensive, in reality as well "as appearance; and intrinsically valuable, and durable, and solid."—From "*Observations on the Gothic Buildings abroad, and particularly those in Italy,*" by T. Kerrich, M.A., F.S.A. Archæologia, vol. xvi. p. 303.

CHAPTER CIII.

Of the Good as well as Evil which has resulted from the Neglect of our Ancient Churches.

837. As there is no evil without good, so perhaps it is fortunate, that since the days of King Henry the Eighth, our Churches have had so little done

to them. With architectural taste and science in a prostrate state, perhaps all remaining beauty would have been reft from these sacred fabrics; the alterations which have been made to them show us sufficiently what it is probable would have been the fate of them: they would, no doubt, have become still worse patch-work than they are; their curiously exquisite carvings would have been changed to atrocious quaintness; their expressive mouldings would have been chiseled away or plastered up; and, in its fatal industry, *the architectural delirium which pervaded Britain for a century, immediately after the fall of Pointed Architecture*, would have left us little from which we could, at the present day, revive the art of our fore-fathers.

CHAPTER CIV.

On Public Inscriptions.

838. In accordance with the other fragile modes of performing, in modern times, every thing connected with buildings, is the proceeding with regard to public inscriptions.

839. Inscriptions on buildings and other public monuments, are of the utmost value, both nationally and individually; they are part of the history of the country; they rectify doubtful chronology, and give the best proofs connected with many an otherwise obscure point. It is the incumbent duty of every one in office to affix these in their proper places, and to preserve faithfully those which his ancestors and predecessors have left him.

840. But now, often, instead of inscriptions being cut indelibly in the solid stone, they are merely fixed to the surface of it; and first half one letter drops off, then half another, then one or two whole letters, till at length the inscription becomes a mere exhibition of detached mutilated letters and figures, which cannot be deciphered.

841. Again, what folly and expense are fallen into, in the frequent painting and re-painting of the inscriptions in Churches. Of what value to themselves or to posterity, is the short lived immortality which church officers acquire by the blazonment of names, which their successors erase as soon as possible?

842. Surely, if an official name be worth writing up in a Church, it is worth preserving there.

843. It would afford most valuable historical information, if, in all Churches and other public buildings, the names of all officers, and the accounts of all repairs, improvements, and buildings, were preserved, cut upon tablets of stone: in like manner should be preserved accounts of all benefactions; for at present, these being frequently erased before they are correctly copied, the accounts of them become either wholly lost, or are but very imperfectly restored; such tablets, properly formed and arranged, would add in a remarkable degree to the interest and beauty of such fabrics: the stranger would never return from them uninstructed.

CHAPTER CV.

Of How, while the Other Arts and Sciences have in England in Modern Times Advanced alike with Honour and Satisfaction to their several Professors and the Admiration of All Mankind, the Art and Science of Architecture is Well Nigh becoming an Annoyance to People in General, from the Quarrels and Irritation which have become engendered amid its Professors, the Men of Literature, and those who Possess the Power of its Patronage.

844. If any thing else were wanting to prove the real *moribund* condition of architecture in England at the present day, it is the singular fact, that while all other arts and sciences have at this moment in England arrived at a pitch of glory which their several professors in peace and good fellowship alike with mankind at large confess, architecture has here become a prey to indecent and disgusting quarrels among its professors; there are not wanting some, who amid the irritation of this vilely disturbed science, laying aside the natural amiability of their disposition, which they display with a well-governed kindness upon all other occasions, would settle the question of taste in architecture with the pistol and bullet: it is chased in mock seriousness and petty warmth by those afflicted with idleness and linguar incontinence, through Gardener's Magazines, Newspapers, and other vehicles, the editors of which, from the far different nature of their education, are, in general, totally unacquainted with it as a science, or they would not allow themselves to be so far imposed upon as to admit in their pages the greater part of the unscientific and coarse vituperations which carry the repute and practice of architecture from bad to worse, and amuse the world at the expense of the art and of its professors.

845. Amid all this ungracious turmoil, and the profligate folly which emanates from it, one unprincipled quack, who has no feeling for the honour of himself or of his art, endeavours to outwit another, and undertakes for only as many hundreds of pounds as formerly thousands were thought to be requisite for the formation of some Church or other public work, which if not for style (for let us at present leave that out) would at least for structure, materials, and finish, be looked upon, or be overlooked, alike with contempt by Pericles and his coadjutors, by the great Ionian architects, by those of ancient Rome, by the Palladj, and the San Michelj of Mid-eval Italy, by the Joneses, the Wrens, the Chamberses, and the Stuarts of modern England, and by the Steinbaches of Pointed Architecture. But enough has already been said of the inferiority of the stability of modern structures.

846. While the professors of other arts and sciences seem each to have plucked, if possible, from the tree of knowledge a loftier, a greener, and more florescent branch, and have found that branch a *peaceful* palm, and their knowledge attended by no curse,—if those of architecture have, in modern times, really plucked a topmost branch from the tree of the knowledge of good and evil, it is bitter, it is attended with a double curse, and greatly is the sorrow of the English architect in the conception of his designs multiplied: for if he would build with symmetry, some trifler with the shattered wrecks of antiquity of the "baser sort" displaces him; if he would *construct* with soundness and wisdom, some cement-monger will step before him; if he would bring to his projected works all the assistance of geometry and other sciences to vivify them with aboriginal excellences, one who has scarcely more than heard of such accomplishments will prevail over him.

847. Who doubts the ability of the modern surgeon? Are the professors of that divine art the sport of diurnal bickerings in those publications which exist alone by the quarrels and scandals of society?

848. Who doubts the learning, the integrity, and the piety of the body of our divines? Do they by individual conceited views and quarrelsome dispositions spend in profitless disputes that time which is too short for their studies and for the exercise of their calling?

849. In sculpture, who doubts the high ability of our Chantreys and other great men, some of whose works, at least, are as much divine and immortal as aught of the handy-works of man on this side the grave can be? and against whom not a whisper is heard, whether by high or by low, by rich or by poor, by learned or by ignorant? Delightful result of nature and of truth beautified by inspiration.

850. In chemistry, who undertakes to prove that its Davys were misguided and ignorant men, and follows the present perverse practice in architecture, of attempting to prove that he who made in times back the greatest advances in his day in the art, and was, from his intercourse with princes and nobles, the most gifted with opportunities of practical improvement, was undeserving of his repute, though his buildings have delighted succeeding generations and will still delight those to come?

851. In astronomy, that sublimest of sciences, in which there would be field enough, at least for dispute, were its professors so to waste their time instead of in research, which of them vilifies Copernicus, or Newton, or Halley, or Maskelyne, or Herschel? which of them brings his art (exalted in majesty above all others) into contempt by disputes, as profitless as whether a block of stone, which may be ennobled by the chisel of Greece or of Mid-eval Europe, should be mammocked by the tobacconist-sign-hacking of the reign of Elizabeth?

852. While we go from stone to brick, from brick to plaster, from plaster to sand, from oak to fir, from fir to pine, from carving to putty, from putty to paper, does the produce of our looms cease to improve in fabric and material? Do our chronometers become coarse and of indelicate fabric? Does our engraving cease to advance in delicacy, cheapness, and general diffusion? Do our potteries and works of porcelain flag in rapid advance of material, or design, or painting, as well as in cheapness?

853. In short, in machinery, mill-work, steam-engines, and in every other art and manufacture which can civilize mankind and add to the comforts and elegances of life, has there not of late years been more advance, if possible, than in the increase of bickerings and in the depreciation of the structure and materials (at least) of architecture, whatever difficulty the general reader, from the observations on the subject by party writers, may have of determining the question of architectural taste?

CHAPTER CVI.

Of How the Quantity of our Architectural Knowledge Possessed by One Professor Seems to have Diminished with the Number of Professors.

854. The structural excellence of English buildings, and the boldness and richness of their architecture, appear to have gradually diminished, till the death

of Sir Robert Taylor, whose works were in general beautiful miniatures ; Sir Robert reared comparatively few pupils, and he took a friendly regard in advancing them in life ; and if they did not all become, amid the fall of their art, very eminent as architects, most of them, at least, filled their several stations with integrity and respectability, and obtained emolument sufficient to prevent them from seeking subsistence in the downfall of an art already but too far advanced in a state of caducity.

855. After the deaths of Sir William Chambers and Sir Robert Taylor, an entire change came over the practice of architecture. To these succeeded James Wyatt, who was a man of considerable talent, but destitute of grandeur of design, a man of another race, a slattern in business, not a scientific architect, a man not alive to the dignity of building soundly, who could not feel the honour of having it said ages after his death, "We owe this great work to the skill and science of James Wyatt," and who appears to have been unable to appreciate the disgrace of having it recorded of his works, "The former structure by James Wyatt soon falling to decay, the whole of it was taken down and rebuilt in its present style :" most of his works are formed of materials so mean and unsubstantial as to be wholly unexampled in the annals of architecture : of his chief works Fonthill Abbey fell down a few years after his death ; and Kew Palace near the same time arrived at premature decay, and buried in its ruins the workmen who were employed in removing its ill-favoured heap. Such men as Wren, gentle-minded and Christians as they were, would rather have committed suicide than have incurred such disgrace : and yet James Wyatt did not foresee all the baseness in the materials and structure of edifices which would in the end become prevalent ; he did not foresee what men of humbler calling would perform for buildings of humbler destination.

After receiving emolument from public and private employment, enough to have formed a princely fortune, he died a pauper, displaced from the surveyor-generalship ; and by the confusion in which he left the affairs of the Board of Works, he drew such discredit upon professional architects, that it was then, by the government, deemed expedient that the surveyor-generalship should not be held by a professional architect, although the office had been illustrated by men of such high attainments, such sterling talent and ability, and of such unbending integrity, as Sir Christopher Wren and Sir William Chambers. From the moment that the surveyor-general was directed to exercise in his office no attainments higher than those of a common honest clerk, the fall of English architecture seemed to outstrip time itself ; helter skelter it went to ruin, faster than the national debt went on increasing, more rapidly than the great and immortal Wellington gained his victories : millions of money were then expended in avenues of Parker's cement ; by fatal advice Bath stone came as a curse to London to add a load of discredit to our modern poor Church architecture ; this led the way to mere sand ; there was no Wren, no Chambers, at the head of affairs to direct our statesmen and our Church dignitaries in the use of lasting and really economical materials ; till at length to badness of material is added badness of structure : but if a Smirke, disgusted with this, for some time hold up against the general depravity, he is at length overcome, and is forced into the use of plaster and Bath stone, or, like Laing and Nash, he would, though with less justice, be displaced.

856. Amid all this decline of virtue and science, Sir John Soane certainly retained a desire to build substantially, as far as the littleness of his architecture would allow him ; but then to him are owing all the bad taste, the reedings and scorings, which for twenty years cut up our architecture, and which the influx of the knowledge of Grecian and of Gothic details has hardly eradicated, and that not before many of our finest Churches have suffered from the taint, in the loss of their fine old rich ceilings and carved oak pewings, all in character with

the whole of each building, like those of St. Magnus, London Bridge, St. Michael's, Cornhill, and St. Paul's, Covent Garden.

857. But in the meanwhile Sir John had found out the secret of having the drudgery of his professional business performed by un-salaried clerks, for whom he cared nothing, and who did not assist him without adding to his already considerable revenue : these again thrown upon the world before they had become proficients in their art, some too proud, some too rich to seek employment, and some not fortunate enough to obtain it for a few years, till they had become thoroughly versed, practically, theoretically, and scientifically, in their art,—from the pupils became the opposers of their master, and in a sort of self-defence, and for emolument, and for the saving of expenditure, engrafted upon the profession to the third and fourth generation a new race still less and less informed, and from the subdivision of business having still less and less practical experience, till, at length, so very fallen is the practical study of architecture, that often is the pupil at present received for no purpose other than because the older practitioner needs an unsalaried door-keeper or light-porter. The acquirements which it is now possible for a young man to obtain in an ordinary office have gradually grown less and less, till at length, in many cases, the pupil, instead of having his mind, his integrity, his talents, and invention expanded—from disoccupation, or from useless busy-idleness, falls into low debauchery, or only acquires those vices of structure or design which a Greek, a Jones, a Wren, a Chambers, or a Stuart, would have taught them to avoid.

858. These pupils, and the mighty influx of others from other quarters, finding no easy means of really studying their profession, or of obtaining sufficient livelihood by it, for the most part mis-spend their time in making competition designs which are never chosen, or in filling the columns of Magazines and Newspapers with absurd boastings of the wonderful improvements in architecture, or with pretended inventions for the super-session of brick and stone, by which their employers are defrauded of their capital.

CHAPTER CVII.

All the Materials Used in a Building should Form Part of its Structural Strength ; Of How the Moderns Fail in this Particular ; and of How Much the Expense of a Building is Increased while its Strength is Diminished by Material merely Acting Dronishly upon the Other Parts of a Fabric.

859. It is a rule *in buildings of creditable rank*, which admits perhaps of no exception, that every piece of material which is added to an edifice should not merely increase the ponderousness of the general mass, but should be so artfully and intimately connected with the other material of the fabric as to form an integral part of its substance : this cannot be effected by cement, by glue, by cramps, or other such means ; handicraft knack cannot do it ; it must result from the mind ; it is not the business of the workman, but that of the architect ; it is the result of wisdom, not of dexterity.

860. The lath and plaster ceiling of a modern fabric is so much mere addition to the weight hanging upon its beams or joists ; the stone vaulting of a Gothic Cathedral, by the scientific management of its flying-buttresses and

pinnacles, presses together the layers of the wall-buttresses, and confines them in their places. Again, if there be any bands or projections on a modern plaster ceiling, so much mere additional weight is hung to the woodwork: but the stone ribs of Gothic vaulting, instead of being weighty additions, form the nerve and strength of the vaulting itself, while the intermediate mere panel-work, divided into only small sections, extremely thin, vaulted to keep up the principle of compression throughout all its parts, but lying in rebates between the stone ribs, stiffens them in the same manner as glass stiffens the bars of a sky-light. A chandelier of great weight, or any other heavy burthen, hung to a flat plastered ceiling, will tend to bend in and draw down the timbers and plastering, and will sometimes break them; such a pendant weight hung to the ribs of Gothic vaulting, will press together more firmly the voussoirs of the vaulting and flying-buttresses, and glue them as it were together; and if the work be truly constructed, it will not fail till weight enough is added to crumble the stone by compression *.

861. A statue, or other heavy mass, erected over an intercolumniation, or square opening, tends to break the entablature, or the lintel, above which it is set: a pinnacle, or a statue, surmounting the wall-buttress of a Gothic Church, increases the resisting mass, and by its peculiar situation stops suddenly, and, as it were, reins in the drift of the vaulting.

These things are exquisitely beautiful; but like flowers and fruits, they are far more useful and economical than beautiful. The pinnacles and flying-buttresses of modern structures, in general, perform no beneficial office: and though merely intended to be ornamental, they are rarely fine in shape and outline; their whole materials form expensive luxuries; in the ancient examples of them, the carving is the only sacrifice for beauty, and what a sacrifice! there is not a clown who does not feel their elegance.

862. In St. Alban's Abbey and York Minster, whose naves have not been vaulted with stone, the flying-buttresses remain unbuilt to this day.

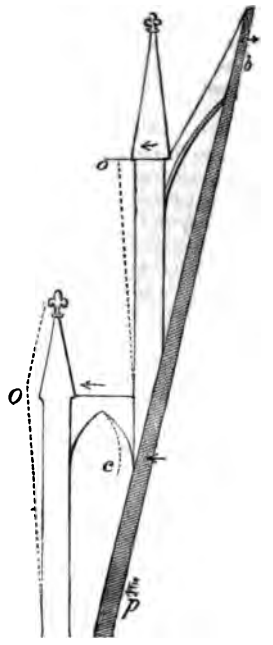
863. The modern imitator of Gothic architecture, frequently merely from caprice, places diagonal buttresses at the angles of his buildings, which angles are already stronger than the other parts of them, and these formed of brick-work, from the breach of the bond in setting the bricks angle-wise, sometimes crack wholly away from the body of the work, upon which they have perhaps for some time hung as a burthen; the object of our forefathers in setting buttresses angle-wise, was to resist boldly and at once the diagonal expansion of the diagonal ribs of the last severy of the vaulting: two buttresses (of sufficient united power) set square near the meeting-angle of the two walls would perform the same duty, but less simply and economically.

864. Most of the decorations of modern steeples are merely intended to be ornamental, yet they but rarely fill out gracefully the outlines of such structures to pyramidal forms; the ornamental bands which girdle Gothic spires, form a series of ties which unite at convenient intervals the stiff angle-ribs of the work; the pinnacles which surround the base of a spire with such witchery of effect, not only fill out in the most graceful manner the outline of the structure to a pyramidal form, while they give it intricacy and richness of detail,—but scientifically, they afford checks to the thrusting power which the base of the spire might otherwise exercise against the angles of the upper part of the tower. In

* If any particular severy of the vaulting be intended to be weighted in the manner here stated, care must be taken that the pinnacles and buttresses be duly proportioned to the weight to be resisted. In proportion as energy is added to a flying-buttress, weight must be added to the pinnacle, in order to diverge that energy within the wall-buttress, or the wall-buttress will be thrust over.

the same manner the flying-buttresses which frequently rise from behind the angle-pinnacles of a square tower to some distance up the angle-ribs of an octagonal spire, resist all outward spread of the base of the spire. Some modern Gothic towers are made with flying-buttresses attached to only one side of them; these perform no office, and are merely showy excrescences, and intrinsically are as ugly as useless; they cost something, and add to the dronish part of the materials, although perhaps made so flimsy as to appear at a distance like mere wires.

865. We even find modern instances of Church steeples, in which their Flying-buttresses are made to pitch against and to overthrow the *upper parts* of the angle-pinnacles of the square towers from which they rise, instead of the energy exercised by the bases of the spires against the summits of the towers being communicated to the *bases* of the pinnacles, and thence diverged by the pinnacles perpendicularly down the main-angle buttresses of such towers. For Flying-buttresses, we also in the like situations, see used instead of *semi*-arches, whole arches, which by the least stress collapse, and are thence useless. And further, sometimes, in a case where an unnecessary exuberance has been fallen into in a steeple of paltry materials, by raising a second series of Flying-buttresses—we observe those very buttresses, though themselves of proper form, pitched against the slight panel-work of the sides of the spire; instead of *two* Flying-buttresses rising from each-angle of the square tower, so as for each of the eight angle-ribs of the spire to be restrained by a buttress, and thus for the stress of the eight spire-ribs to be condensed *perpendicularly* within the four strong angles of the square tower itself. These several abuses are as unpicturesque as they are unmechanical, as unartistic as unscientific, as barbarous as ruinous, as expensive as they are destructive.



p—b. Section of spire pyramid.
O. Pinnacle thrust *over* by a Flying-buttress pitched against its *upper* part.
c. Collapsing of a Flying-buttress of improper form.
o. Second pinnacle thrust *over* in the same manner as the lower pinnacle O.
b. Thin panel-work of the sides of an octagonal spire *burst in* by the heads of Flying-buttresses being pitched against them instead of against the angle-ribs of the spire, which ribs should be bonded into the panel-work and be stiffened at intervals by horizontal bands, or string-courses bound by cramps or chains of uncorrosive metal.

866. In modern buildings which have no pretensions to the geometrical structure of the freemasons, perhaps the worst instance of a large portion of the materials (and those the most costly) performing merely a dronish and parasitical part, is the mode of making the external facings and decorations hang as a burthen upon the other parts of a wall.

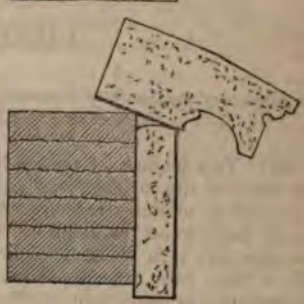
867. In § 358 has already been shewn how modern brick-work fails in this respect: indeed, there are not wanting specimens of 120 years old of brick-work faced with *gauged work*, which, from the reduced *height* of the cut-facing-bricks, could only be tied in at large intervals, where the horizontal courses of the front work and back work happened to correspond in altitude; in these, by the gradual crushing of the materials, the external work separated from the internal work and bulged outwardly: and this effect lately took place in some

modern costly houses in the Poultry, London, the outsides of the fronts of which were of gauged-work.

868. But the modern system of facing walls with stone is still worse; in many works there is not the semblance of tie or bond from top to bottom, except the *iron* cramps with which the thin ashlaring is attached to the brick-work, and which cramps frequently rust and flush off the front of the stone-work.

869. This is a most crazy description of building, and should be banished as worthless and contemptible from a city and a nation of unbounded wealth, and possessing more science and philosophy than were enjoyed by any other city and by any other nation in any other age, and that too which produced the finest specimens of architecture.

870. Cornices which project from ashlaring so ill connected with the walls themselves, are rarely safe; for you may be sure that economy has not allowed stone to extend upon the wall, much beyond a mere counter-balance to the part of the cornice which overhangs; in fact, the centre of gravity of the cornice-stones is rarely seated more than an inch or two behind the outer face of the ashlaring, so that if the ashlaring, which bears indeed the chief burthen of the cornice, bulge, and sink, the cornice will follow it.



871. If the block out of which a stone cornice is chiselled will only just balance upon the wall before it is wrought, every atom detached by moulding it, removes its centre of gravity further within the wall. But we see at the present day cornices composed of cement, and Yorkshire paving-stone; at first, the stone is projected so far as to need shores for its support till the cement in which it is embedded is set; the weight of the projecting part is then frequently tripled by the addition of cement mouldings, so that were you to walk over such a cornice, you might either over-balance the whole, or cause it to snap off; three inches of paving-stone being frequently the only substance upon which a cornice two feet high depends.

872. These faults are not to be charged upon the workman, for nothing perhaps could exceed the patience and ability with which our working masons perform their department; these workmen, who are worthy of better employment, are as careful and exact as our bricklayers are rude and careless: their beautiful surface-work deserves to be better employed.

873. If it should be still insisted that ashlaring be not bonded into a wall, the outer side of the brick-work should undoubtedly recede from the perpendicular, so that the weight of the parasitical coating of stone may, under any vicissitude, fall close against the wall and not from it.

874. All the masonry which Wren applied to his buildings appears to be well bonded into the brick-work; and though many of his best Church-towers are evidently composed internally of the ruins of preceding buildings, yet by judicious bonding, by rendering the work wholly geometrical, and by reducing all the gravitation to the simple compression of the materials, his buildings are in general more sound than modern works, the walls of which are composed of better materials.

875. It thus appears that in good architecture there is such an economy of materials made use of, that no parts of them are merely ornamental, and scarcely any ornament is not structural.

876. In many modern structures which are pretended to be economical, a full half of their materials are neutralized, one fourth of them being a mere burthen, and another fourth being merely occupied in supporting that burthen; such structures would have been equally strong if composed of half as much materials, more justly considered, and more artfully disposed: it is not pretended that they ought to have been built with half the materials; for so many of them menace ruin, that they would not have been too strong if they had possessed all the strength capable of being produced from their component quantity of materials.

CHAPTER CVIII.

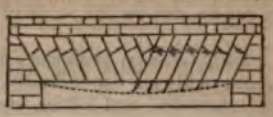
The Neglect of the Study of Dynamics a Principal Cause of the Instability of Modern Edifices, and of the Waste of Materials in them.

877. THE neglect of the study of *Dynamics*, or the laws of force, is a principal cause of the instability of modern edifices. The practitioner having had no grounding in this science, performs almost every thing in practical architecture by mere guess, assumption, tradition, or caprice; hence, if his building hold together, it is ofttimes rather from good-fortune than from science; and while in many cases a large portion of the materials which are made use of perform no duty, in many cases another large portion of the materials not only do not afford any support or stability to the fabric, but really by the force of their gravity work a positive injury to the other parts of the edifice.

878. It is to be regretted that the study of *Architectural Dynamics* is so far neglected; for while this neglect continues, the execution of every considerable work requiring science will more and more pass away from the architect to the engineer, who, while he is in general better acquainted than the architect with gravitation and the laws of force, not unfrequently is as careless of the beauty of his works as the architect is regardless of their soundness and durability; thus we have many works which are *ab initio* in shivers, and many others which, though generally sound, are, from their offensive uncouthness, a satire upon that folly which should, at so great an expense, attempt for beauty that which to every one is rude and disagreeable.

879. TILL A PROFESSORSHIP OF ARCHITECTURAL DYNAMICS IS INSTITUTED, ENGLISH ARCHITECTURE WILL MORE AND MORE DECLINE, more and more dependence will be placed upon cements, pins, cramps, and ties for the counter-action

of that terrible gravitation-havock which he, who is well versed in the laws of force, can allay merely by the skilful disposition of the materials of works, so that their own weight shall counteract each other's gravity. The perishing of science in architecture will continue till even the false arch appears a comparative virtue, to such an unheard-of pitch of folly will it arrive.



880. True economy in architecture requires that a comparatively small quantity of materials shall be put together in an honourable and scientific manner, so as, by the laws of force, to be so far at rest as that no portion of the work shall exercise any irregular excentric power, so as to force out of due position any of the parts of the edifice, and thus cause motion, cross-strain, and the other effects of a complicated mass of materials, ill at rest in itself.

881. Had Michael Angelo understood the laws of force, his dome of the Vatican would not have been split all over; did our bricklayers understand a little of Dynamics, our streets would not form one disgusting succession of broken work; did our carpenters generally understand the counter-action of forces, the walls of our houses and public buildings would not be thrust out and twisted by the gravitation of roofs and beams,—almost every quartered-partition would not sink,—almost every floor would not give way.

882. The science of *Architectural Dynamics*, with shame be it spoken, is actually involved in such mystery, that it may be said to be almost dead to the builder, except in great works of engineering; the reason of this is, that architects and builders have not in general studied mathematics, and mathematicians have not studied building.

883. It is not to be supposed that the free-masons could have had a very advanced acquaintance with mathematics, and yet so refined were they in the application of the best science of which they were masters, that their knowledge of Dynamics, probably obtained through the most exact practical experiments, carried them further, more beautifully, and more economically, into the mysteries of construction, than all that has yet been gleaned in modern times from the astonishingly more advanced state of science; while almost all other arts and sciences have in England, in modern times, in the most wonderful manner outstripped even imagination, (except in a few domestic conveniences of rank, such as the invention and wants of the day were ever capable of producing) building has, during the last eighty years, gradually assumed a meaner, a less substantial, a less geometrical, a more deceitful, nature.

884. The study of *Architectural Dynamics* can restore to architecture sound construction, good materials, legitimate adornment, and the moderate expenditure of true economy.

885. The soundness and economy which result from the due use of *Architectural Dynamics*, are as much necessary in the cottage as in the great public bridge, or more so; for the labouring cottager is less able to bear the expense of useless material, and of the repair of a crazy fabric, than the public, which indeed has all the expenditure return to itself with the loss only of the work, whereas the cottager losing his house loses his money also.

886. If *Architectural Dynamics* were duly understood, how could have arisen the monstrous ignorance of interdicting the erection of spires upon arch-buttresses, while the instance of St. Dunstan's in the East is before our eyes?

887. Were *Architectural Dynamics* properly known in modern architecture, how could the French nation, in calling for designs for a great Church, interdict the cupola, not on the score of taste or of cost, but from the *fear* of failure?

888. Give us professors of *Architectural Dynamics*, and with less than the present national expenditure upon buildings, we may have arches domes and spires, broader, and loftier, and more sublime, than have perhaps ever appeared in the world.

889. When we have done our duty by disposing in the best manner the materials of an edifice, if we have then any judicious cements and ties to add, let us render more secure that work by their addition. But these are the things by which the unscientific ruin their buildings,—they trust to these instead of to skill. If a carpenter can with dry materials shore up a building, so can a mason build one with dry materials: but nearly all our modern walls, arches, vaults, domes, towers, and buttresses, would fall either while being erected, or the instant they were completed, if piled up dry. With the free-masons they would have fallen, but they would have *fallen together*; with us they *fall apart*. Where then is our improvement in building? Does all our science in building consist in cement?

890. The perishing nature of our modern houses, occasions the capitalist to claim more than double the interest of the public funds for his rental, and yet he is often a loser by his speculation.

891. Surely by hiding the mal-constructions of edifices, cements have proved hitherto more a curse than a blessing; the occasional good use of cement as a mortar, could never atone for the impoverishment of structure, and the florid grimy frippery with which our despicable edifices are now ruined in appearance and ruined in fact. Architectural Dynamics and Parker's cement are now mortal enemies; they might be the best of friends, and mutually assist each other for our benefit.

CHAPTER CIX.

On the Want of a Proper Acquaintance with Architectural Chemistry.

892. CHEMISTRY which has proceeded such astonishing lengths in discerning the constituent materials of the mineral and vegetable kingdoms, and in the separation of gases, so that the God of nature seems, in the nineteenth century, to have delivered up to man one of nature's keys,—chemistry, that art, by the knowledge of which this century is ennobled, has hitherto done nothing whatever for architecture, the due practice of which depends at every step upon an intimate acquaintance with the characters of natural productions; but while chemical knowledge has opened more and more, the durability of building-materials has been less and less studied, till at the present day the chemist will tell you that the materials the most frequently used in architecture are such as are least capable of duration; nor needs a chemist to be consulted upon this fact,

for the rapid decomposition of the materials of modern edifices is apparent to every one who will not shut his eyes ; and the fact has become a by-word, not only with the perverse in old-fashionedness, but with the least obstinate, and those of opinion the least biassed.

893. Thousands of years ago, in a climate hardly visited by rain once in a year, and in which even crude bricks will endure (it is said) for thirty or forty centuries *, the Egyptians chose for their important buildings the hardest and most compact granite, which is not yet in the slightest degree deintegrated ; and if they and the Greeks, even in their soft climates, ever used stucco, as has been asserted, it was rather as a varnish to fill up the pores of rough stone, in the same manner as in our own time, wax has been used for the same purpose.

894. In architecture we possess but the most indistinct knowledge of the chemical action of materials upon each other, and of their various degrees of oxidation ; but we amply make up by rashness for want of experience in chemistry ; while there are not wanting crowds of new cements and roof-coverings, and of metals in states of oxidation, destitute alike of good aspect and of durability, for which we are ever ready to leave oak, bronze, lime-stone, granite, terra-cotta, and those other few but almost universal materials, which our forefathers and their predecessors of high antiquity, gifted with but the slenderest knowledge of chemistry, by an honest discernment chose as the most proper for architecture ; and that their choice in general was wise, is attested by the fact of so many ancient works having survived thousands of years, while so many of our own decompose and pass away before ourselves, short-lived as we are.

895. One of the greatest boons that could be bestowed upon us, as a profession, or indeed upon mankind at large, would be a work upon *Architectural Chemistry ;* there are not wanting highly gifted proficients in chemistry, who by a due consideration of the wants, integrity, and beauty of genuine architecture, might furnish us with a complete developement of the nature, constituents, affinities, decomposition, oxidation, and other properties of the minerals and other natural productions which are, or ought to be, used in architecture, or which should be excluded from it.

896. The chemist could tell us what materials should approximate, what cements should be used for them, whether iron should be joined by acid as we see in works of engineering ; he could tell us at once what materials are solidified or are decomposed by the atmosphere, or by water, or by fire ; we might then see at once whether the multitude of patent inventions, on behalf of which we are perpetually importuned, are beneficial inventions, or are mere enthusiastic failures, or trade frauds.

897. The chemist might afford us tests, whereby the integrity of metals, paint, varnish, and of many other materials could be readily ascertained, and thus prevent the commission of frauds : and delicate as may be the search, perhaps some enlightened natural philosopher, by infusion, microscopic examination, or other treatment, could enable us to prove the nature or the authenticity of timber, relative to which so much deception may be practised, notwithstanding the ease with which it is pretended fraud can be detected.

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* Wilkinson.

CHAPTER CX.

Of the Little Knowledge which we possess with regard to Chimneys, and how Experiment and Inquiry on an Extensive Scale are Nationally required, both for Health, Economy, and the Cleanliness and Beauty of Buildings.

898. In a country which is frequently moist and cold, and whose inhabitants by the progress of civilization have become chiefly an in-door population, the hearth and the domestic chimney must be of the very first importance: we are all as much entitled to comfort in this respect and to health, as we are to life itself: and yet so small is the improvement in the management of fire-places which has been made during the last two hundred years, though during that time, from diffusion of literature and the peaceful nature of our country, we have become a complete fire-side nation, that it may be doubted whether any substantial benefit has been effected in the health and comfort afforded by our chimneys: —and even though our apartments may be warmer, it may be doubted whether they are not much more smoky.

899. New inventions for the forms and management of stoves, succeed each other with rapidity; but soot and head-ache seem as prevalent as ever.

900. Very little appears to be known with regard to the proper formation of flues, except that they mostly require to be of considerable length, especially if seated in low places; and though this discovery was made in an early stage of Pointed Architecture, in which we can frequently find not only the best, but the handsomest chimneys; yet in assumed imitations of Classical Architecture, by notions founded altogether upon absurdity, the height of the chimney is depressed, and the future ugliness of building is insured by all manner of uncouth extraneous additions of earthenware, tin, and other materials.

901. All that expense which is frequently so absurdly, and with such ill-success, expended in the concealment of chimney-shafts, should be rather used in ornamenting, and in rendering agreeable, members so necessary to the comfort of domestic buildings. Instead of chimneys being considered as eye-sores, the appearance of a dwelling-house without them should rather be considered ridiculous: that they may be made both agreeable and ornamental is proved by the examples of them to be found in Pointed Architecture.

902. Notwithstanding all the shrewdness professed in modern times on the subject of chimneys, our knowledge of them is in the most immature state,—simply because, although millions of chimneys are built, none are built experimentally; and in fact so many of them seem reduced in dimension, as to refuse free admission for the quantity of smoke which should ascend them.

903. Ten thousand pounds devoted by Parliament, for the erection of *Trial Chimneys*, of various altitudes, in high and in low situations, on acclivities and in plains, waved contracted and finished in various ways, and to be watched during various seasons, winds, and states of the weather, might save a world of ugliness, a world of head-ache, soiling and destruction of property.

904. At present the decorations of an apartment are not unfrequently spoiled in three or four years, simply by the smoke refusing to ascend its chimney.

905. Perhaps if one furnace were constructed in the basement story of a house, the flue of which should be carried in several convolutions round the external walls of the fabric, the whole house might be warmed from a single vaulted apartment, within which the heat should be carefully retained, the further means resorted to being simply to fit up every room with an inner lining of slate panels set in frames of metal, the heat from the furnace-room being admitted between the walls and the inner lining, as was the case in the Laconicum of the ancient Roman Bath. This ancient method is worth a new trial: each living-apartment would have no communication whatever with any smoke-flue, and every part of a house might perhaps be thus made equally warm. The paneling and frame-work might be made in imitation of Gothic tracery, or in any other manner that might be desired, so as to be conducive to ornament rather than to ugliness, which latter we have to regret is the case too often with schemes deemed philosophical. That philosophy is mal-adroit which departs from the beauty of nature.

CHAPTER CXI.

Architects not Scientific Men, and Scientific Men not Architects, the reason why Architectural Science and Scientific Architecture degenerate.

906. There is at present such a gulf cast between architecture and science, that architecture instead of improving and blending more and more with science, degenerates and becomes every day more and more detached from it.

907. The mathematics forming in general no part of architectural study, none of these sciences are usually infused into architecture; while the mathematician having no knowledge of the construction, details, uses, and embellishments of architecture, writes in general profitlessly for the architect; he cannot apply his knowledge to the construction of buildings, for he has no practical knowledge of it; while his algebraical theorems, which might be of use to thousands in building, being in a language unknown to them, form as it were a sealed book. The natural philosopher in applying his knowledge to architecture, forgets that it is one of the fixed laws of nature to clothe its deep science in external beauty.

908. This was not so formerly; nothing was more advanced in science than architecture: now the architect is outraged at the uncouthness produced by the man of science, when he dabbles in architecture, while the man of science views with contempt the broken and irrational nature of modern architecture. The architect turns from an acoustic den, with the same contempt as would an ancient baron,—while the natural philosopher despises servile irrational imitations of former architecture, which keep not pace with the advanced state of science.

CHAPTER CXII.

Of the Resources still left to the English Architect, although Taste seems at a stand, and Constructive Excellence has departed from most English Buildings.

909. Although the classical acanthus is run upon almost to death, and from the desire to procure novelty in a small way at any expense seems often in the

very agonies of expiration;—although the olive has been brought almost into contempt by vulgar copying upon a wholesale scale;—although the Grecian honeysuckle has become so common that the petulant in art would now rather use instead of it the mere stubble of the lower empire;—although Grecian and Roman columns have been within the last twenty years multiplied as by enchantment, of all dimensions and of all kinds of materials, from the placebrick-enclosed scaffold-pole to the cast-iron pipe, from the coarse grit-stone to the mound of concrete, with all the novelty of irregularity of altitude inter-columniation and detail, till even architectural abuse and architectural mal-construction seem at a non-plus—THE ENGLISH ARCHITECT HAS STILL SOME RESOURCES LEFT.

910. Chemistry is still open to us, it can tell us what materials are fit for particular purposes, what are durable, what are incorruptible. We have no architectural chemists, and our buildings are destroyed by the atmosphere almost as fast as they rise.

911. Geology is still open to us; we have no architectural geologists to direct us in the search of lasting and honourable architectural materials.

912. Mechanics is still open to us, that mighty science, which has made England a conqueror with her manufactures as she has been with her fleets and her armies: while the wonderful machines of modern England have facilitated, cheapened, and at the same time rendered more exact and perfect almost every chattel of use or elegance and every article of attire,—yet has architecture scarcely received from mechanics during this age of outstripping science any one machine for facilitating, improving, or rendering more exact the operations of building: in the adaptations of the parts of a modern building, a knowledge of mechanics in its present wonderful state of advancement ought to do something astonishing, whereas we have not a single building erected in England since the eighteenth century, which exhibits the least approach to the exquisite ingenuity exhibited in the union of outward beauty and innate science by the edifices erected in an age deemed barbarous.

913. Geometry, that art without which architecture is childish and barbarous, is open in its full range; that art, which like electricity passes through all good architecture, whatever its age, whatever its style, whatever its purpose, unobserved indeed by the foolish who have negatived its powers, till this mighty agent has reached us in a thunder-storm, and has wracked even our hospitals and our buildings erected from charity-funds, as though an earthquake had rent their very foundations: no architectural student is ever asked whether he ever so much as heard of the name of Geometry.

914. The resources of Statics and Architectural Dynamics are still open to us; those sciences which, when philosophy was at a low ebb, taught the Romans, and after them the Arabs and the freemasons successively, how to sustain aloft two thousand years and more immense masses of material, and after that how to raise and sustain aloft for ages, masses thinner than those of our meanest and most crazy modern fabrics; those sciences of high intellect and refinement, which in ages past rendered buildings firm yet daring, rooted to the grouud yet piercing the clouds, mechanical yet more artist-like than aught of modern work, well enriched yet not costly, as proverbs in the mouths of all yet destitute of the slightest approach to vulgarity: while by the sad reversal of exchanging *dynamics* for cements, and statics for pretended taste, even our institutions and many other buildings erected from benevolence, become in the first year of their existence masses of creaking ruins, filling the mind of the Christian, of the Philanthropist, and of the genuine architect, with one humiliating feeling of disgust.

CHAPTER CXII.

915. But who says that the architect of modern times has no resources left in taste? Who says that he may not yet, in a thousand different ways as he chooses, work up the details of Egyptian, of Classical, of Pointed, or of any other *true and genuine* style of architecture, taking care as he values his repute for wisdom and elegance of mind, that the stuff on which he works shall be of the right quality for his purpose, woven with the best texture of the best materials; and that none of such precious cloth shall be wasted, none applied to an useless purpose; for we cannot find an ancient building, or any part of one, which, when erected, was useless.

916. Who says the modern architect has no resources left in taste? Are the chiseled treasures of England's 20,000 noble old buildings of Pointed architecture, among which not one coarse, silly, or vulgar work is to be found—are they exhausted? Are those of Scotland, those of Ireland, those of France, Germany, Flanders, Spain, Portugal, exhausted? Some of these have taken many lives to design, many ages to execute, and would take years to delineate.

917. What fields have we still open, almost untrodden, in any style of architecture! If the convolvulus and a few field flowers, afford us curves, bells, leaves, enrichments, more bold, more elegant, than all the wide range of every kind of architecture can exhibit, what resources have we in nature's whole floral range, and in her luxuriant fruitage?

918. Have we not still the whole book of Scripture, with its succession of actions and histories to adorn our sacred fabrics? Have we not the history of our Church, to be pictured by the Chantrey and the Westmacott, with the cunning of attic art, the truth of nature, and the divine spirit of Christianity?

919. Have we not as yet for architectural sculpture, the 2000 years of our own history, of which we all feel that we are proud—almost too proud?

920. Have we not yet the whole history of science, for the sculptural friezes and panels of our public institutions?

921. How then can the modern English architect in his resources "have come to a perpetual end?" It would rather appear that he has scarcely begun his research.

922. He has still all science, and nature, and religion, and history, at his command. Will he seize the vantage-ground? If he will, shall the world be any longer pestered with the paltry bickerings, whether a particular edifice shall be of the corrupt Elizabethan, or the corrupt Cinque-cento, or the corrupt Louis-quartorzine, which are all but so many different phases of that poisoning burning fetor, which immediately after the fall of Pointed Architecture, came like the immeasurable bursting forth of one mighty volcano and covered all Europe, leaving that proud science smothered, bed-ridden, without strength virtue chastity; while but a few—a Palladio or a San Michali, a Jones or a Wren, whom God endued with peculiar science or nobleness, a generous devotion to art, and skill but seldom found, shone like meteors amid the darkness, and broke through the bad examples shewn them by a world of corrupt pretenders.

CHAPTER CXIII.

On the Probability of an approaching great Change in English Architecture.

923. A friend of the Author, with whom the subject of the fall of English architecture, has been a matter of frequent conversation, is of opinion that the unsubstantial wavering of taste, the chaos into which English architecture has dissolved, the eager raking out, the delineating, the admiring, and the copying of every transition, in times when architecture sickened between its different changes,—the seeking for the *patois* of architecture, rather than its *classical* expression,—that all this indicates the approach of a mighty change, when the sickening will be thrown off, and the once noble science will start into new vigour, stride with robust steps over the soiled garments in which it lay consuming, and which shall have fallen from it, and leave the chamber of putrid air within which it has been immured.

924. Many, like Mr. Hope, wish for a style which we may call *our own*, but time alone will show whether this will ever be the case: there will soon be room enough for the active workings of such a change, for as with the army of Xerxes, an hundred years will be amply sufficient to seal in death nearly all our present modern buildings; so that the next age will know by rumour alone their corruptions,—till again, in bad times, some curiously idle professor shall reproduce them, to give the *coup de grace* to the then fading style; then again, as at present, the mean-souled professor *will exchange SYMMETRY, GRACE, and SCIENCE*, for *PASSING WHIM*, satisfied with no more durable immortality than is sought for the pattern of a printed calico.

CHAPTER CXIV.

Proposals for the Foundation of a Great National College, for the Study and Regulation of Architecture throughout the British Dominions, for the Examination of Students and Professors of Architecture, and Artificers in Building, for granting Honorary Degrees to Proficients therein of various Stages of Maturity, and for the Conservation of Public Buildings.

925. SEEING that from various causes, notwithstanding the great power wealth and luxury of the English nation, its architecture has so fallen back in general structural excellence,—seeing that we have as a profession to bear alike the taunts of the ignorant and those of the tasteful,—it behoves us to examine whether there may not be discovered some sufficient national remedy for evils so great.

926. A contemplative mind will not be long in discovering that nearly all the defects in modern English Architecture, result from three principal causes.

927. Insufficient practical, theoretical, and scientific education of the architect.

928. Want of sufficient practical scientific knowledge on the part of the builder.

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929. General unacquaintance with the *principles* of taste and scientific structure, on the part of the public.

930. Insufficient knowledge on the part of the architect, renders him rash, and ready to carry into execution the most extravagant, ruinous, and absurd proposition, and causes him to mistake structural meanness for economy, and thus to misguide his employer, and often to induce the public to withdraw the care of works intended to be excellent, from practitioners better skilled and more capable of laying out money to advantage.

931. Insufficient knowledge on the part of the builder, not only occasions him to second every bad project, but what is still worse, to influence the minds of those who would either build better, or would employ a professional man of talent and integrity, in whose opinion they would otherwise have confidence. Perhaps more than three fourths of the buildings throughout all England are rendered ugly, unstable, and inconvenient, though costly masses of folly, through the misguided labours of builders of no reputation, who are as unacquainted with the principles of taste as of architectural mechanism. Comparatively few among the great mass of the public will lay out a proper sum in the erection of a good and substantial building, while a builder of no rank will persuade them to undertake something which they are taught to believe will scarcely cost half so much, and will answer the purpose equally well, though it eventually turns out that the work neither does answer the purpose, nor is built so economically. From this class of builders must be separated all the honourable and skilful members of an art to which we are all as much indebted as to any class of men in existence.

932. General unacquaintance with the principles of architectural taste and scientific structure on the part of the public, that public almost universally admits. How very ill the public caters for itself in the matter of tasteful and scientific building, may be gathered from the popular worship of that public for all the ancient churches, temples, and other buildings, in the formation of which it is well known no public had any interference.

933. The priesthood and the freemasons built the countless Gothic Churches of Europe; they are all cherished by the public, after the orders which formed them have centuries since passed away. While the best of the modern buildings of Europe afford scarcely a detail from which we can copy, almost every atom of the buildings of the Greeks Romans and of the Europeans of the middle ages affords a delightful field for the research of the modern architect draughtsman and modeller.

934. But at the present day, it is well known that the architect has frequently less controul over the form, arrangement, materials, and structure, of an edifice, than parties who are unacquainted with their own wants, the method of laying out to advantage their own money, and of procuring to themselves comfort and credit from their expenditure.

935. A very large proportion of modern edifices are erected by persons who have every thing in their art to learn, whereas the buildings of the middle ages were alone intrusted to the most accomplished and experienced *master-masons*, who brought to their assistance all the knowledge, tradition, and science of the architects of all Europe, and who probably in difficult cases had the benefit of the experience of the whole chapter, or perhaps of all the chief masons of Europe and Asia, not indeed delivered as a heterogeneous mass of opinion, but the voted result of their combined experience: there is little doubt of this having been the case, and that every new invention was subjected to practical trial before its adoption, since the most daring projects, which to the inexperienced appear un-

stable, were contrived upon just estimates of their strength, and their perfect duration has justified their adoption, and proves that the freemasons wrought upon sure ground, upon theories derived from experimental science.

936. The fact of the buildings of the freemasons in all countries more nearly resembling each other than even the buildings of modern times which are universally copied from the widely spread prints of classical architecture, incontestably proves that in times when literature was so little diffused, there must have existed a wonderful co-action and government of so great a fraternity, and that its wisdom must have been as remarkable as the secrecy of its records.

937. It appears then that for the restoration of architecture, the architect, the builder, and the public, must either improve in taste and knowledge more or less, according to the several parts which they have to perform in architecture, or that some one at least of them must so improve.

938. The architect must possess taste and well-grounded skill, but his taste skill and integrity must receive encouragement and support from the other members of the community, or he will, as at present, sometimes "*for a piece of bread*," act neither as the steady friend or servant of his patron or employer, nor of his own reputation.

939. The builder must without exception be taught the elementary principles of the scientific part of practical building, so that he may neither destroy the property of his employer nor give that employer bad advice.

940. The public should learn that from the misfortune of modern English buildings, in which it has had so much hand, either it must acquire a better mode of judging of what is for its own advantage in architecture, or else that after giving general directions as to its wants, it must trust implicitly to professional men of acknowledged taste, skill, and probity, for the honourable and profitable fulfilment of its wishes.

941. It is not pretended that the nation does not possess taste in the main, but the very reverse of it; one proof of the existence of *national* taste with the mass of the people, and apart from the bias of education and the mannerism of schools, is the fact that the *people never* lost the admiration of Pointed Architecture, although it could not describe and imitate exactly the minute details of it; and further, that *that* admiration of it has outlived prejudice, and has re-met the revival of, and the appreciation of Pointed Architecture, although to the architectural student a proper knowledge of the subject is a work of extreme slowness and difficulty, and one in which, at the present day, not one student in a thousand shines much.

942. It is proposed therefore for the scientific acquirement of architecture, and for the regulation of the practice of architecture throughout the British dominions, that a great National College shall be established, the chief regulations of which shall be as follow:—

943. That every architectural student who shall have studied *six* years, shall, after he has been examined by the professors, and has been found to possess the requisite knowledge of drawing, geometry, mensuration, and mechanics, be considered an architect of the lowest grade, and shall be entitled to bear after his name the letter [illegible]. signifying "*Mason*," and shall be also entitled to receive payment as a Practical Architectural Clerk, and to act as Clerk-of-the Works at any public building.

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944. That every architect who shall have received the degree of "*Mason*," shall after *four* years' additional practical study, and after he has passed a further examination by the Professors, relative to his knowledge of the principles of classical architecture, and of the architecture of the middle ages, and who shall have acted as clerk-of-the-works, for a period of not less than six calendar months, at some public or private building of sufficient importance, shall be entitled to bear after his name the letters *F.M.* signifying "*Free-mason*;" and shall be entitled to act as a Practical Architect, and to receive payment for the exercise of his practical profession.

945. That every architect who shall have received the degree of "*Free-Mason*" shall, after *four* years' additional practical study, and after he shall have passed a further examination by the Professors relative to a more intimate acquaintance with the nature of the construction of buildings, the nature and strength of materials, their prices and economy, and a further acquaintance with Gothic architecture, its principles, ages, countries, and various styles, shall be entitled to bear after his name the letters *M.M.* signifying "*Master Mason*," and shall be entitled to design, construct, and repair Public Buildings, and to hold any public office of Architect or Surveyor, and shall be allowed to take pupils, articled clerks, or architectural apprentices.

946. That every architect who shall have received the degree of "*Master Mason*" shall, after *six* years' additional practical study, and after he shall have passed a further examination by the Professors, relative to a higher knowledge of mathematics, the nature of materials, their strength, duration, and proper application, the knowledge of hydrostatics, centres, bridges, and generally of a higher and more enlarged knowledge of the construction of great works, besides an intimate acquaintance with archæologia so far as relates to architecture, shall be entitled to bear after his name the letters *M.M.M.* signifying "*Mathematical Master Mason*," and shall be entitled to act as a *public* architect and engineer, and to construct public bridges, piers, docks, and other works of engineering, and to hold any public office of engineer.

947. Thus it would be to be hoped that no work of engineering, public or private, would exhibit rudeness in design, and that no work of architecture would exhibit premature decay or failure.

948. That every workman who shall have arrived at the age of twenty-one years, shall be examined as to his knowledge of practical building in his particular trade, and shall be entitled to bear after his name the letter *a.* signifying "*Artificer*," and shall be entitled to receive wages in his particular trade; that every master carpenter, and other master builder, who shall be examined as to his knowledge of the practical part and general economy of buildings, including an acquaintance with trussed work and arches, shall be entitled to bear after his name the letters F.A. signifying "*Free Artificer*," and shall be entitled to act as a master builder in his particular trade, and to enter into contracts for the performance of any public or private work.

949. That all persons whatsoever, who shall have received degrees, and shall show themselves unskilful in any matter committed to their care, shall, in a chapter of the college, after proof of the fact, be deprived of the particular degree which such unskilfulness shall show was granted without just cause: but such degree shall be restored upon proof of further study after further examination.

950. That all persons whatsoever, who have received degrees, and who shall be proved to have committed any dishonest action, or who shall be guilty

of any breach of trust in the matters confided to their care, shall be for ever deprived of their degrees, and be deemed incapable of acting in the profession of an architect or engineer in future.

951. That a register shall be kept, engraved upon copper, of all the mathematical master masons, master masons, free-masons, and masons, and of all the artificers and free artificers, and of all those who may be deprived of their degrees; and that any person shall, on payment of a certain fee, be entitled to have a copy of such register printed upon paper, or of any part thereof.

952. That there shall be constantly exposed in the principal Great Hall of the College, a tablet, upon which shall be written the names of all the existing mathematical master masons, master masons, and free masons.

953. That after death the names of all mathematical master masons shall be engraved upon tablets of marble, stone, or metal, to be preserved for a perpetual memorial.

954. That upon a stone tablet in the outer Hall of the College, shall be engraved the names of all persons who, from dishonesty or breach of trust, shall have been deprived of their degrees.

955. That the names of all architects who shall have completed any public building, beneath the amount of the contracts for the same, shall be registered in the transactions of the College; and in like manner shall be registered the names of all architects who shall have completed any public buildings at an expense amounting to ten per cent. beyond the amount of the contracts.

956. That her Majesty the Queen shall be invited to be most graciously pleased to be the sovereign patron of the College, and to institute a masonic order of knighthood for the distinction of those members of the College, who shall in her Majesty's judgment be deserving of her Majesty's approbation.

957. That every nobleman of Great Britain and Ireland shall be a president of the College.

958. That every member of the House of Commons shall be a vice-president of the College.

959. That the senior mathematical master mason shall be for life the grand master of the College.

960. That the presidents for the time being of the Royal Society and Antiquarian Society of London, and the president of the Royal Academy of Arts, shall be adjutant-masters of the College.

961. That the council shall consist of the mathematical master masons, the six senior master masons, the bishops and judges of England, and of ten other lay peers and ten members of the House of Commons to be nominated by her Majesty.

962. That a register be kept of all national surveyorships, county surveyorships, and other public surveyorships, and of all public appointments of architects, and that upon any vacancy being declared in such offices, the senior *master mason*, who has no previous public office, shall have the said appointment, but with permission, if the local situation of the appointment should not be convenient to him, of foregoing his term for the next or any subsequent vacancy,

and that any person already holding an appointment, may exchange such appointment for any other appointment which may become vacant, it being intended that seniority and ability shall be rewarded in manner best to insure the study and perseverance of men of integrity.

963. That the designing and erecting of all public buildings, which shall not fall by office to any public architect or surveyor, shall be competed for by the two senior *mathematical master masons*, and by the two senior *master masons*, and the choice of the designs shall be settled by a committee composed of an equal number of the *professors*, *mathematical master masons*, *presidents*, and *vice-presidents*, of the college. The candidates shall each be paid a sum sufficient to remunerate him for his pains in making the design; and all the designs shall be exhibited publicly in the Great Hall of the College; and the chosen designs shall be engraved, and prints thereof shall be given to every member of the College for his information and to assist his study.

964. That all designs shall have the names of their inventors attached to them, that every competitor shall be allowed to give both personal, verbal, and written descriptions of their several designs, their merits, composition, distribution, construction, and general nature. No competition drawings to have any colours thereon other than such as may be necessary for distinguishing the different materials proposed to be used in the work itself.

965. That for the information of the umpires, the professors shall each give in his particular art or department of science, a written opinion upon the merits and construction of the several designs, all which opinions shall be preserved in the chapter records, and shall be printed and distributed with the engravings from the designs.

966. If either of the four senior mathematical master masons, and master masons, shall have then in hand any public building which is not then roofed in, the next members of the College are in succession to have the competition for the work; and also should any member of the College erect any public building, the cost of which shall exceed 20 per cent. the amount of the contracts for the execution of the same, he shall lose his next chance in competition, and shall lose also his next turn to any office.

967. That in order to facilitate the acquirement of architectural science, both theoretical and practical, and to assist the students in the acquirement of collateral knowledge, the College shall have the following professors:—

A Professor of Classical Architecture.
A Professor of Pointed Architecture.
A Professor of Oriental Architecture.
A Professor of the Archæologia of Architecture.
A Professor of Classical Architectural Sculpture.
A Professor of Pointed Architectural Sculpture.
A Professor of Mathematics and Geometry.
A Professor of Arithmetic and Algebra.
A Professor of Mechanics.
A Professor of Architectural Dynamics.
A Professor of Pile-driving and Engineering.
A Professor of Chemistry.
A Professor of Geology.
A Professor of Mineralogy and Metallurgy.
A Professor of Hydrostatics.
A Professor of Stone-masonry.

A Professor of Carpentry.
A Professor of the Jurisprudence of Buildings, Estates, Tenures, Neighbouring Properties, and Nuisances, (a barrister).
One (or more) Professors of Ancient European Languages.
One (or more) Professors of Oriental Languages.
Four (or more) Professors of Modern Languages (to be also Foreign Secretaries).
A Professor of the Modelling of Buildings in small.
A Professor of the Modelling of Classical Architectural Ornaments.
A Professor of the Modelling of Pointed Architectural Ornaments.
An Itinerant Delineator of British and Irish Buildings, both Ancient and Modern.
An Itinerant Delineator of Foreign Buildings, both Ancient and Modern.
A Principal Secretary.
A Second Secretary.
An Accountant.
A Registrar and Calculator of Architectural Prices.
An Admeasurer of Artificers' Works.

A Master Timber-merchant.
A ——— Carpenter.
A ——— Stone-mason.
A ——— Bricklayer.
A ——— Slater.
A ——— Plasterer.
A ——— Smith.
A ——— Iron-founder.
A ——— Brass-founder and Copper-founder.
A ——— Ironmonger.
A ——— Plumber.
A ——— Painter.
An Ornamental Painter.
A Master Glazier.
A ——— Glass-stainer.
A ——— Paper-hanger.

968. That the salaries of the professors shall vary from £30 to £300 per annum, according to the importance of their several services, and the state of the funds of the College.

969. The duties of the several professors shall be to instruct the students in architectural knowledge, its theory and practice, in drawing and modelling, the nature of materials, their strength, duration, and chemical nature; the professors of languages shall translate such ancient, learned, or foreign literature, as may be required in the pursuit of architectural knowledge, shall procure architectural works in various languages, and shall assist the students in the translation of them; and all the professors shall give such lectures as shall be annually determined upon, and shall, moreover, examine such points of knowledge as the chapter shall from time to time direct to their notice; and shall prepare such reports and literary works as the chapter shall from time to time publish for the information of architectural students.

970. That no *mathematical master mason* or *master mason* shall be permitted to take an additional pupil, articled clerk, or architectural apprentice, till his senior pupil, articled clerk, or architectural apprentice, shall have obtained the

degree of "𝔐." or has either obtained permanent employment as an *architectural clerk-of-the-works*, or shall have certified to the College his intention of either travelling to obtain architectural information at home or abroad, or shall have determined to pursue his studies without entering any service.

971. That every year there shall be held a grand chapter of all the *presidents*, *vice-presidents*, *mathematical master masons*, *master masons*, *free masons*, and *masons*.

972. That every month a chapter shall be held of the council.

973. That all tracts which the Professors shall compose, relative to their several branches of science, by direction of the grand chapter, shall be printed at the expense of the chapter; and copies thereof shall be distributed among the *masons*, and other members of the College.

974. Every member of the College, before he is admitted to the degree of 𝔉.𝔐. is to have made five builders' estimates, and to have measured the work of five buildings at the least, in order that he may be able to judge of the correctness of estimates, and admeasurements of builders' work, and to detect any frauds therein.

975. All merchants of timber, bricks, tiles, stone, slates, lime, lead, iron, brass, copper, glass, and paint, four times in every year to transmit to the College the prices of the materials sold by them, in order that the legal price of the materials of all builders' work not done by contract, may four times in every year be determined by the College.

976. The College to have the power of determining, under the guidance of the Judges, the exact nature of dilapidations, both civil and ecclesiastical; and every arbitrator of dilapidations, or of disputed accounts of builders' work to be a member of the College, who has obtained a degree not lower than 𝔉.𝔐.

977. All the apartments of the College to be entirely fire-proof, and to be designed so as to admit of constant addition, without embarrassing or injuring the former buildings, as the property of the College shall increase: every addition forming an integral part of the establishment, so as both to increase the splendor and dimension of the pile. But certain apartments of the establishment may be fitted up in different styles, so as to afford ocular examples of the descriptions of building having relation to the effects contained in such apartments. All the models, drawings, prints, and books of architecture, belonging to the College, to be distinctly classed, and to be arranged in exact chronological order, so as to facilitate the study of Architecture.

978. In order that the College may carry on successfully its extensive operations, the following means of obtaining a revenue are proposed:—

£20 to be paid for every articled clerk, architectural student, or architectural apprentice.

£10 on granting the diploma of	—	—	—	𝔐.
£20 on	ditto	—	—	—	𝔉.𝔐.
£30 on	ditto	—	—	—	𝔐.𝔐.
£50 on	ditto	—	—	—	𝔐.𝔐.𝔐.

£5 to be paid by every builder on his obtaining the diploma of F.A.

£1 per annum for the admission of every private amateur, who shall not practise as a professional architect.

Gifts and bequests to be received.

Parliament to be solicited for an annual grant, and to afford premises for the College.

One twentieth part of the gross emolument, obtained by members of the College from public architectural works, to be paid to the College.

No part of the permanent funds of the College to be dissipated; a certain portion thereof to be laid out in reversionary or other estates, till the provision of revenue sufficient for the entire management and purposes of the College.

One fifth part of the gross receipts of the College to be from time to time laid out in reversionary estates of 20 years' abeyance at the least, in order to provide a fund which shall be at the disposal of the College, for the purpose of upholding and restoring the Cathedrals, Parochial Churches, and other architectural beauties of the British dominions: and the College, in concert with the several ecclesiastical and the other collegiate bodies, to have the upholding of all ecclesiastical and collegiate edifices.

Every architect who shall have obtained the degree of *fifi.* to deposit with the College an accurate figured drawing of some existing building, or of some part thereof, such as the chapter shall direct, before he shall obtain any further degree; and an engraving of every such drawing shall be made, an impression from which shall be given to every architectural member of the College, in order that the nature and construction of the finest buildings may be universally known.

Every professor shall, upon his appointment, present to the College, as a gift, some work, his own performance, in his particular branch of art or science.

Every member of the College, who shall carry into execution any public work, shall present to the College a complete set of copies of the working-drawings, specifications, and accounts of the same; or should such member of the College decease during the progress of a public work, all the papers relating to such work to be given up to the College.

Every plasterer before receiving the degree of *a.* shall deposit with the College an accurate cast or model of an architectural ornament from some existing building, such as the council shall direct.

Two copies of every book and print relating to architecture and architectural antiquities, to be presented to the College by the publishers thereof.

The Museum of Sir John Soane, from containing one of the most extensive collections in existence of architectural books, models, and casts, to be united to the College.

979. Thus, by a single great association, is proposed to insure to the public, as well as to each private individual, the greatest economy in building, accompanied by the most advanced taste, science, and skill, and that strength and that security, which can alone be creditable in outlays so great as always result from building; and to obtain to every building the advantage of the wisest, and therefore of the most serviceable, as well as of the cheapest structure.

980. Secondly, to insure to the architect and engineer a speedy education in all the art and science of building; to draw forth honourably in beauty and integrity his energies, his ability, his invention; to insure to his knowledge and integrity a certain gradation of well-earned and cheerfully-granted profit, as well as honour; to discharge him from all frivolous pursuits; to insure among the whole of the members of the college a community of knowledge, friendship, and kindness, and a total discharge from every petty concurrence for mean and worthless works, and from that discreditable canvassing for office and employment,

which occupies at present so large a portion of the time of many practitioners, and which so often at the present time leaves the most important offices in the hands of those least accomplished in art and science, and to those of least probity, from men the best versed, and the most generous, and of the greatest probity, feeling a natural distaste for canvassing, and the description of self-protrusion, which is at present necessary for obtaining office.

981. Thirdly, to insure to the builder the acquisition of as much practical science as will protect him from the discredit of failure ; to insure to him confidence and security in working under architects of acknowledged prudence ; to save him from the injury which he at present suffers from builders of low repute and integrity working with such influence upon architecture in general as to occasion little of respectable in building to be performed ; and, lastly, to insure to him the assistance of workmen who have been instructed in those plain rules of good practice, the want of which at present causes to the master-builder, as well as to the architect, such serious trouble, besides producing waste of strength and of economy in the conversion of materials.

982. Without the formation of such a society, the peculiar situation of the practice of architecture in England at the present day, but too sadly augurs its total overthrow : the designing the mighty works of engineering, the expending of sterling millions, the conducting of every thing which is grand, has left us ; and while we lament that these are but too often made of forms, the vulgar barbarism of which is a discredit to their science, we dare not say that we have ourselves received the kind of education which should entitle us to obtain from the prudent the conduct of such noble works which alone are worthy of our pursuit : we have little left but to engage in those dishonourable frays which result from the competition for mean and contemptible structures, in which he who can be most deceptive in the structure, the materials, and the outlay, may frequently succeed the best. Thus, in an age of the brightest science, of universal literature, of profound peace, and of unbounded riches, that art which is more important than any other, which engages more capital than any other, upon which social life depends more than upon any other, which forms more of subject for the antiquary and the man of general literature than any other, in which more artificers are engaged than in any other, that art, in times so advantageous, is in a meaner, a more unwholesome and desponding condition, than it ever was at any former period for the last three thousand years.

END OF PART I.

PART II.

SPECIFICATIONS.

983. " Apres qu'on aura consideré les choses cy dessus proposées par les modelles bien faicts " il faut cõsequemment voir si on aura aisément toutes les matieres necessaires pour l'edifice qu'on " voudra faire. Car il me semble qu'il ne seroit sagement faict, ny bien aduisé, de se vouloir ayder " de ce qui est difficile à recouurer, & peult trop couster. Parquoy il fault que l'Architecte s'ayde " non seulement de la nature du lieu, mais encores de ce qui s'y peult trouuer. Et outre ce, qu'il " cherche les inuentions de bien & sobrement appliquer les matieres & à propos, ainsi qu'on les peult " recouurer. Cela bien veu & preueu, il sera facile de mesurer vne toise de chacune chose, comme " aussi la grosseur des murs, & cognoistre combien il y entrera de pierre de taille, de moillõ, de chaux, " bricque, & autres matieres auec la façon. En apres il faudra regarder la totalité des toises qui serõt " en l'œuure : mais d'une chacune chose à part, comme de la maçonnerie & du moillon à part, de la " pierre de taille & bricque aussi à part, & ainsi des autres. Ayant sçeu leurs valeurs particuliere- " ment, il les faudra adiouster ensemble, qui sera chose facile, principalement quand le modelle est " bien faict par mesure. Puis suiuant la toise accoustumée, vous cognoistrez incõtinent combien le " tout doit couster, non seulemẽt en maçonnerie, mais encores en ornemẽts, lesquels vous desirez " auoir. Cela faict, si vous ne voulez tant despendre, vous diminurez de l'œuure, ou bien vous y " adiousterez, s'il vous plaist d'auantage despendre. Si vous y procedez en cest sorte, vous ne ferez rien " à l'auenture, & vous sera grand contentement de voir la fin de voz entreprises premier qu'elles soient " commençées, qui sera acte d'un homme tres-sage & prudent, qui doit touslours preuoir & precogiter " ce qu'il veult faire deuant que commençer."

Philibert de L'orme. Archictecture, lib. I. f. 24. Paris, A.D. 1568.

984. " Le devis est un mémoire instructif de toutes les parties d'un ouvrage qu'on veut con- " struire, il explique l'ordre et la conduite du travail, les qualités & façons des matériaux, & générale- " ment tout ce qui a rapport à la construction & à la perfection de l'ouvrage. Ses qualités principales " sont que toutes les matieres soient mises dans un bel ordre, énoncées clairement & bien détaillées, " sans confusion, n'omettant rien d'essentiel, & de ne laisser aucune équivoque qui puisse donner lieu " dans la suite à des contestations avec les entrepreneurs; il doit être relatif au plan & profil du projet: " quand il est revêtu de toutes ces conditions, il sert de guide à l'entrepreneur, aux ouvriers, & à " l'Ingenieur même, parce qu'alors il assujettit les uns & les autres à travailler de concert et conformé- " ment à l'intention du Directeur, ou de celui qui a fait le projet.

" Il n'y a point de sorte d'ouvrage qui ne demande son devis particulier.

" Le bien du service veut que l'entrepreneur s'exécute & qu'il n'épargne rien pour la bonté des " ouvrages, mais il veut aussi que le même entrepreneur trouve en travaillant bien, de quoi se " dédommager de ses frais et de ses peines."

Belidor. La Science des Ingenieurs dans la conduite des Travaux de Fortification et d'Architecture Civile. Paris, 1739. lib. 6. pp. 2—49.

985. "But upon one point in particular, I should feel that I was acting unfairly by Mr. Burton, " if I did not say that in my opinion he really stands pre-eminent in adhering to his estimates. With " regard to those which he has made for works in the parks, it will be seen from a return now in the " hands of the Committee, how very rarely they have been exceeded. Where there has been any " trifling excess, it is to be accounted for by orders subsequently given to him, and by reference to the " accounts, it will be found that in almost every instance, the work has been executed for something " under what he has estimated would be the cost."

Parliamentary Evidence of the Right Hon. Charles Arbuthnot. 28th May, 1828.

PART II.

CHAPTER I.

SPECIFICATION OF THE ARTIFICERS' WORK to be done in the erection of a DWELLING-HOUSE (of the FOURTH RATE or class of building, under the London Building Act of 14 *Geo.* 3), *and in completing the same with the offices and appertenances thereof fit for use or occupation, upon a certain plot of ground situate in*

for A. B., under the direction of his Surveyor, and according to the following working Drawings of the said Surveyor.

986. (*It is well here to insert a list of the working-drawings, with a note appended thereto stating that the Surveyor will also give any requisite additional or explanatory drawings; but these latter should be merely enlargements of some portions of the other drawings, as it is hardly fair to bind the contractor to execute any work whatever which is not clearly defined and explained before the execution of the contract; and if the work be of importance, it will be more just, and will eventually save time and contention, if all the detail drawings which can by any possibility be required be made and settled before the commencement of the work.*)

BRICKLAYER.

Notice, &c., to District-surveyor, &c.

987. To give to the District-surveyor, to the Surveyors and Commissioners of Pavements and Sewers, and to all the other public officers, the requisite notices, to obtain all requisite official licences, and to pay to the District-surveyor and to all the other public officers concerned in the building and works, their proper and legal official fees and charges.

Ground-work.

988. To excavate the ground to the proper levels, and as may be found requisite for the construction of the foundations, the drains, the cess-pools, and all the other works for which the ground will require to be excavated; to beat down to a hard consistence the ground forming the beds of the trenches for the reception of the intended brickwork; to fill in again and level about the foundations and other works after the same are constructed, the ground so dug

out; to perform to the whole ground-plot upon part of which the house is intended to be erected, such other ground-work as may be requisite in order to level the said ground-plot according to the sectional ground-lines shown by or upon the working-drawings.

Cartage, &c., of Rubbish, &c.

989. To remove and cart away from the whole of the ground-plot building and premises, all the earth soil and rubbish, which will be found superfluous after the ground-plot and soil of the premises are made up to the proper levels and surfaces; and to leave finally the whole of the house ground and premises, entirely free from superfluous ground earth rubbish and useless materials.

General brick-work.

990. To execute in the very best and in the most careful and workmanlike manner, all brickwork requisite in order to erect and complete the house, with the offices and appertenances thereof according to the drawings, and which may be also requisite to render the whole of the house and premises complete and finished in every respect.

991. (*In some cases it is well to describe particularly the several heights and thicknesses of the walls, but in general this is much better omitted, a general reference to the working-drawings in which all these particulars are more minutely shown being much better, and altogether avoiding the danger of omitting by inadvertence some portion of the work, it being scarcely possible to describe in words exactly and intelligibly every part of the brickwork of a large or complex building.*)

Gauged arches.

992. To put to all the front windows (*and other apertures in the front of the building if any*) [illegible] very best [illegible] arches accurately gauged to the proper figure closely in front and at back and a [illegible]

Other arches.

[illegible] openings in the brickwork plain arches closely set, those of them which will be towards the outside, being tuck-pointed externally.

Facings.

994. To face the fore or principal front of the house with the very best hard second malm stocks, matched of a light uniform colour, and finished in the neatest possible manner in Flemish bond, with flat joints accurately drawn. (See § 358.)

Cornice, &c. (if any).

995. To finish the front parapet with a projecting fascia 12 inches wide, supported upon a cut and rubbed dentil cornice of heading bricks, 5½ inches apart, as shown by the working drawings.

Chimneys.

996. To properly turn parget and core all the chimney-flues, to finish the chimney-shafts with salient courses 6 inches high and double plain tile cresting, and to put over each chimney-flue a large sized chimney-pot flanched round with plain tiles; the chimney-pots and the tile cresting and flanching are all to be set in the best new quick Parker's cement and clean Thames sand, mixed together in equal measures.

997. To put to each fire-place a 4-inch brick trimmer and a chimney-bar of wrought-iron ½ inch by 2½ inches, 18 inches

longer than the chimney-opening, and properly corked at the ends.

crestings, 998. To finish all the walls (except the fore-front and those walls which have eaves and slate barges projecting over them) with brick-on-edge and double plain tile cresting, both set in and jointed with the best new quick Parker's cement and clean Thames sand, mixed together in equal measures.

ling, &c. 999. To bed in mortar all the bond-timber, plates, lintels, wood-bricks, templets, stone-work, and other work intended to be set in the brickwork and so requiring; to bed in and point round with lime and hair mortar all the door-frames and window-frames; to back up and fill in with solid brick-work to all stone-work and iron-work intended to be set in the brick-work.

1. 1000. To construct for the support of the sleepers of the ground-flooring, brick piers not more than three feet apart, each 9 inches square, 9 inches high, and with the addition of a foundation 6 inches high and 13½ inches square.

nage, &c. 1001. To construct a barrel drain 12 inches bore from
to
consisting of 4-inch brick-work, and stuccoed on the inside over the lower half thereof ¾ inch thick with pure quick Parker's cement; to put from the privy to the drain, a large and complete brick funnel stuccoed with Parker's cement as described to the drain, [illegible] to the drain another funnel with a dip trap thereto, [illegible] which a sink-stone is to be placed, and stuccoed also all over the inside with Parker's cement and sand, as described to the drain.

1002. (*In cases where communication cannot be obtained with any public sewer, resort must be made to the imperfect drainage of a cess-pool of such dimensions as may be thought requisite.*)

pool (*if any*). 1003. To construct in the situation shown by the working-drawings, a cess-pool, 3 feet 6 inches internal diameter, 8 feet deep from the bottom to the underside of the covering (or dome, if any), and steined round with dry 4-inch hard stock brick-work.

1004. (*If it be deemed that the filtration from the cess-pool will impart a dampness to the foundation or other parts of the house, the cess-pool should be wholly sunk in the ground to such a depth as to prevent this inconvenience; and in some cases it is well to set the whole or the upper part of the steining in mortar or Parker's cement, and to stucco with Parker's cement the whole of the steining, or at least the upper part of it; but in this case the water within the cess-pool will subside with greater difficulty.*)

Perhaps the best covering for a small cess-pool is Yorkshire stone of sufficient strength, as it can be easily removed without damage, which cannot be the case with a dome of brick-work, and the usual covering of wood is the least durable and the least proper that can be applied. If a cess-pool be large it will be best domed over with

brick-work, having only a circular opening in the vaulting from 2 to 3 feet diameter, which opening may be covered with stone in the same manner as the top of a small cess-pool.

Fence-walls.

1005. (*If there be any fence-walls intended to be built, a description of them may be here inserted*).

Stand for Water-Butt.

1006. To erect for the support of the water-butt (if any) two brick piers, each 2 feet wide, 9 inches thick, and 4 feet high, upon three courses of footings of 14-inch brickwork in addition to the piers themselves.

½ Rod extra Brickwork.

1007. To provide and execute under the Contract for the works, half a rod reduced of the best stock brickwork, to be used in such extra works as the Surveyor may direct; the value of such of the said extra brickwork as may not be directed by the Surveyor to be used, is however, to be deducted from the amount of the consideration of the Contract, after the rate of per rod reduced; and to perform at the like price of per rod reduced, in and about the building and works, such additional brickwork as the Surveyor may direct.

Bricks.

1008. All the bricks (except where herein otherwise directed) are to be the very best new approved, hard-burnt, square grey-stock bricks, free from breakage, and from all admixture of soft bricks, place-bricks, or other inferior bricks.

Mortar.

1009. The whole of the mortar to be used in the performance of the brickwork, is to be compounded in the proportion of one third by measure, of the very best well-burnt stone-lime (here insert the name or description of the lime, whether from Dorking or elsewhere), and two thirds by measure, of clean sharp Thames sand, well beaten, and worked up together. (A more particular description of the sand may be given, and if from the Thames, whether taken above Westminster Bridge, below which it is thought to be brackish, and to impart saline damp to the work.)

Mode of doing the Work (see §§ 353—365).

1010. The whole of the brickwork, except where herein otherwise directed, is to be done in manner of English bond, and is to be completely laid in and to be entirely flushed up at every course with mortar; and the whole of the foundation-work is to be grouted with liquid mortar at every course (or at every second or third course, if deemed sufficient, and in thicker walls the work may be grouted all the way up.) No four courses of the work are to rise more than one inch besides the height of the bricks: and there is to be no difference between the soundness and goodness of the outside work, and of the inside work, no variation being allowed therein, except that the work intended to be plastered, is to have the joints thereof left rough for the adherence of the plastering.

Jobbing work.

1011. To perform to the house buildings and premises all bricklayer's work, which may be requisite thereto in the nature of jobbing.

MASON (see §§ 265—295).

Coping.

1012. To finish the front parapet with Portland stone coping, 14 inches wide, 3 inches thick in front, 2 inches thick at back, throated at both edges, and plugged at the joints thereof with lead.

(See §§ 271—284.)

1013. (*If cramps be preferred for holding together the different pieces composing copings or any other description of stone-work, these should be of copper or gun-metal; for the judicious and careful Architect or Surveyor will take it as a general rule, that it is much better to omit cramps and plugs altogether, rather than to make them of either wrought or cast-iron: if omitted, the stones may, indeed, by settlement or other cause, become displaced, but the corrosion of iron inserted in stone-work, invariably rends and destroys the latter; corrosion sooner or later is sure to occur to all iron-work, unless embedded a very great distance within the body of the work: the author of this work has never yet used a single iron cramp, nor will he ever do so; the use of copper or gun-metal cramps and plugs may add a trifle to the expense of an edifice, but the employment of iron for the same purpose is to incur an expense altogether useless. The author of this work has seen in the same building several hundred feet of the impost above the ballustrading, rent from end to end, solely by the iron-cramps of the work losing the lead in which they were embedded, and thence becoming enlarged by the embossing of the rust, so as to wedge the stone into shivers.*)

Window-Sills.

1014. To put to all the front windows, Portland stone sills, 9 inches wide, 3½ inches thick, and properly sunk and weathered; and to put to all the other windows sills of 3-inch Yorkshire stone, 9 inches wide, tooled fair all over, and laid sloping: all the window-sills are to be properly throated. (Sills of Yorkshire paving-stone, though so much used for present saving of outlay, prove very frequently expensive substitutes for handsome architectural stone; for frost will often shiver them from end to end into twenty or thirty detached layers).

Steps, &c.

1015. To put to all the external door-ways, Yorkshire stone, solid tooled steps, with the projecting corners of them rounded off, properly back-jointed, and with proper mortise holes, for receiving the ends of the door-posts; and to provide and fix a cast-iron shoe-scraper, of approved pattern.

Paving.

1016. To provide, work all through on the edges thereof, and lay down in regular courses adjoining to the house —— feet superficial, of the best compact, 2½-inch Yorkshire stone paving.

1017. To repair and make good all damage, which may, by the execution of the work, be caused to the public paving (if any), or to pay to the Commissioners of Paving such sum of money as they may require for themselves so doing.

Chimney-pieces.

1018. To put to the kitchen fire-place, jambs mantle and shelf, each of 1½-inch Portland-stone, 7 inches wide: to put to all the other fire-places, jambs mantles and shelves, each of 1¼-inch Portland stone 5 inches wide.

Hearths and Slabs.

1019. To put to each fire-place, a hearth of 2½-inch Yorkshire stone: to put to the kitchen fire-place, a slab of 2½-inch rubbed Yorkshire stone, 2 feet wide, and 14 inches longer than the chimney-opening; and to put to each of the other fire-places, a chimney-slab or front hearth of 2-inch Portland-stone, 18 inches wide, and 16 inches longer than the chimney-opening.

1020. *It is customary to make the chimney-slabs of small houses only about ¾ thick; this produces a very trifling saving of outlay, yet causes them immediately to break to pieces by the rough usage which the slabs in small houses always receive; and those sub-landlords or intermediate tenants, who have leases of the property, have cast upon them the expense of making good the whole of such dilapidations.*

Sinks.

1021. To put in the kitchen a Yorkshire stone sink, 7 inches thick, containing 5 feet superficial, fixed with proper bearers, and cut out to receive the waste-pipe, and the grating thereto. To provide and fix over the drain-trap a five-hole sink stone 15 inches square, sunk out of a piece of Yorkshire stone 4 inches thick.

Holes, &c., and finishing.

1022. To cut in the masons' work, such holes, rebates, mortises, sunk-work, and grooves, as may be requisite for the thorough completion thereof; and to clean off and finish properly the whole of the work, immediately prior to the completion of all the other works of the house and premises. All the mortar used in the work is to be of stone-lime, of the quality described for the brick-work. (See § 1009.)

SLATER (§§ 542—3).

Countess Slating.

1023. To cover the roofs, and the top and sides of the dormer, with the very best strong Countess slates, securely fixed with strong copper nails, and pointed on the inside with stone-lime mortar with sufficient hair therein.

Bond, &c.

1024. Every part of the slating is to be properly bonded, particularly at the eaves and at the heading-courses thereof, with cut slates wherever requisite for keeping the bond uniform, instead of having as in the more usual mode slates laid length-ways with narrow slips between them.

Reparation.

1025. To repair and leave perfect to the satisfaction of the Surveyor, all the slating at or immediately before the final rendering up of all the works of the premises as complete.

Filleting.

1026. To fillet the slating wherever requisite against the brickwork, with Parker's cement, strong cast-iron *(or copper, as the case may be)* nails being first driven into the brick-work, not more than 3 inches apart, in order to secure the same.

1027. (Lead step flashings are to be preferred to fillets of mortar, or cement, and may be used where the employer will permit the extra outlay which they occasion.)

1028. (But projecting fillets of brick or stone, set level or raking, as may be needful for the occasion, and built into the substance of the walling, are the best of all, though the exactness which they demand in their execution, does not suit the rudeness and improvidence of modern practical building, in which the principal fabric is carried up by thoughtless and unskilful workmen, and all exactness is produced afterwards, by cutting away and by additions.)

CARPENTER and JOINER (see § 337—340).

New Materials, &c.

1029. To provide sufficient new materials for, and frame, fix, and complete all carpenter's work, and joiner's work, which will be requisite for carrying into effect, and for finishing in every respect, the house with the offices, fittings, and appertenances thereof, according to the working-drawings, and so as to render the same complete; and to provide and furnish to the carpenter's work and joiner's work, all proper nails, screws, and other needful ironmongery, of the best quality.

1030. (*If any of the materials of a former building are to be used again, an allowance to that effect should be here inserted, and should be noticed in the minute particulars of the work.*)

Timber and Deal

1031. All the oak timber is to be of the best English growth; all the other timber is to be either Dantzic, Riga, or Memel yellow fir; all the joiner's work, flooring-boards, skirtings, and other wood-work, are to be of the best yellow Christiana deal, except where herein otherwise directed: all the timber and deal are to be cut out perfectly square, and entirely free from sap-wood, and from shakes, large knots, wany edges, and all other defects.

Sundries.

1032. None of the joists, ceiling-joists, rafters, and quarters, are to be respectively more than 12 inches apart.

1033. To provide and fix all requisite centering, turning-pieces, beads, stops, fillets, tilting-fillets, backings, blocks, linings, casings, furrings, and bearers: to provide and fix 112 lbs. of wrought-iron, in such ties, bolts, and straps, as the Surveyor may direct: and to perform such rebating, grooving, tonguing, beading, scribing, chamfering, housing, jointing, mortising, framing, dovetailing, planing, and other work and labour, as may be found requisite for the perfect performance of, and the thorough completion of the whole of the house, and of the offices, fittings, and appertenances thereof.

Hoarding.

1034. To provide and fix all requisite temporary hoarding for inclosing the ground-plot, while the several works thereon are being performed.

Shoring.

1035. To perform all shoring (if any be required) (see Index).

Bond-timber and Wood-bricks.

1036. To put in the brickwork all round each story of the

house, and other buildings, two complete tiers of fir bond-timber, 4 inches by 2½ inches, properly lapped at least 6 inches at all the joins, and spiked together in lengths as great as possible.

1037. (*If great economy be consulted, one tier of bond-timber to each story of the building may suffice; and indeed if the walls be strong, and the foundation good, there cannot be too small a quantity of bond-timber; above all, none of it should ever be put round a basement story, or in any other situation where it is liable to rot.*)

1038. It would be well if bond-timber and all other wood-work, were by Act of Parliament forbidden to be laid in party-walls: a 9-inch party-wall of stock-brickwork bonded only with iron-hooping, and of good structure, would then resist fire, as well as most 18-inch party-walls built as at present.

1039. To put all wood-bricks requisite for fixing the skirtings of the ground-story, and the other finishings and works so requiring.

Lintels.

1040. To put such lintels and filling-in-lintels as may be requisite, in order to carry the brickwork over the openings; each lintel is to be 4 inches high, 15 inches longer than the opening, and of the width of the brickwork.

1041. (*The only proper use of wood lintels, is to receive the wood finishings of apertures in walls; in no instance should they be trusted to for support, as they are subject to the destruction of rot and fire; for these reasons they are better if not much longer than the widths of the openings, and each with an arch sprung above it reaching from end to end of the lintel, so that if the lintel be destroyed, the brick arch above it shall remain sound.*) If the soffit be very wide, still two small lintels will be sufficient for maintaining the soffit: there is no occasion for the expense, waste, burthen, and danger, of large solid timber, in such cases.

Ground Flooring.

1042. To construct the ground flooring of 1¼-inch yellow deal, listed free from sap-wood, wrought and laid folding upon fir-joists, 4 inches by 2½ inches, and with oak sleepers under the joists, scantling 4 inches by 3 inches and not more than 4 feet apart.

1043. (*Great care should be taken to avoid the fatal error of inserting wall-plates and other timbers in the brickwork at the ground-story, or in any other situation where they are subject to rot, and, consequently, to render the flooring and walls dangerous.*) (See § 324.)

One-pair Flooring.

1044. To construct the one-pair flooring, of inch yellow deal listed free from sap-wood, wrought and laid folding upon fir-joists 6 inches by 2 inches, trimmers and trimming-joists 6 inches by 2½ inches, and with wall-plates to the back and front, and to one party-wall (if any) of fir scantling 4 inches by 4 inches.

1045. *If two wall-plates be put opposite to each other in the same 9-inch wall, combustible material will extend through the whole thickness of such wall.*

Roof over the principal Building.

1046. To construct the roof over the principal building with fir timbers and wood-work of the following scantlings and sizes:—

	Ins.	Ins.
Wall-plate	4	by 3
Four tie-beams	10	2½
Rafters	4	2
Ridge and hips (rounded for lead)	8	1
Slate-battens	2	1
Lear-boards	8	0¾

Ceiling-joists spiked in one length beneath the tie-beams, and secured to fillets at the ends ... 3 by 2

Inch yellow deal gutter-bottoms laid on bearers to a current 1½ inch to every 10 feet run, and with 2½-inch drips.

A dormer, with frame-work, and rafters 3 inches by 2 inches, slate battens 2 inches by 1 inch, ridge of ¾-inch deal, outer trap-door and inner trap-door, both ledged, and with ¾-inch deal, beaded stops and linings, and hung with hinges and other ironmongery value together 6*s*., and with all other requisite fittings and appertenances.

(A particular description of the proposed ironmongery of the dormer may be given, if such be deemed necessary.)

(See § 411 & 550.)

1047. (*Valley-roofs, with centre gutters, are thought to answer the purpose for small houses standing together in a row; but they are very imperfect in point of mechanical construction, and should never be used to any building of a better class, especially to detached houses, as the leverage of the rafters invariably thrusts out the side walls, unless sustained by an equal counter thrust; in all cases the weight of the roofing, which ought to rest upon the walling, is merely hung upon the gutter-plates, which, in consequence, almost invariably sink in, driving beneath them the quartered-partitions and floorings throughout the house, so that the whole fabric becomes disfigured, the doors bind, and the wet either lodges in the gutter or over-runs the lead-work of it: and besides this, it very commonly happens that the ends of the gutter-plates (which support the largest portion of the weight of the roof) cause the piers of the back and front walls to give way, and carry down with them the arches; these piers often themselves having no foundation, but merely resting upon ill-supported timber breast-summers.*)

1048. *The common valley roofs save guttering*, BUT LEAD TO A CONSIDERABLE INCREASE IN THE HEIGHT OF THE WALLS.

Roof over the Outbuildings.

1049.

	Ins.	Ins.
Wall-plates	4	by 2½
Rafters	4	2
Two angle-ties, each 3 feet long	3	3
Slate battens	1	2

(If there be any peculiarity in the nature of any of the roofing, it must be distinctly explained.)

Quartered-partitions.

1050. To separate the back and front rooms from each other

by fir quartered-partitions, with heads and sills 4 inches by 4 inches, door-posts, side-posts, plates above the doors, and braces, all 4 inches by 3 inches, king-posts and queen-posts 4 inches by 4 inches, quarters 4 inches by 2 inches, and one tier of inter-ties to each story 3 inches by 1 inch.

1051. *Accurate drawings should be made of all the quartered-partitions in an intended building, whether great or small, in which every thing should be most carefully designed upon the true mechanical principles of trussed work; it is through a neglect of this, that by far the larger portion of our dwelling-houses are internally hideously drawn out of level and perpendicular, and are with the floors and door-heads wracked on one side or are otherwise deformed. And it is highly necessary in altering buildings to take care not to produce the same effect through want of caution and judgment.*

1052. *Quartered-partitions are absolutely necessary in the upper stories of buildings, where the space is required to be subdivided; and when they are properly constructed so as not to bear in an improper manner upon floors and other weak parts of a building, but to hang as it were self-sustained merely upon firm end points of support, they form one of the most simple yet ingenious scientific pieces of geometrical construction which the art of man ever invented; in all other cases brick walls, which are sounder and will neither rot nor burn, are greatly to be preferred, nor is there any increase of expense unless the brick-work be very thick.* (See §§ 544—550.)

Deal framed partitions.

1053. To separate the passages and staircase from the rooms, and inclose the closet under the stairs and the closet by the kitchen by framed partitions three panels high, with rails styles and muntins of $1\frac{1}{4}$ inch deal, and panels of $\frac{3}{4}$ inch deal planks not glued and not more than $10\frac{1}{2}$ inches wide.

Skirtings.

1054. To skirt every part of the house and out-buildings (except the coal-house) with $\frac{3}{4}$ inch deal, 6 inches high, plugged to the walls.

Angle-staves.

1055. To put to the angles of the chimney-breasts proper angle-staves, rebated and beaded to such of the rooms as are not intended to be papered.

Windows.

1056. To fit up all the windows with $1\frac{1}{2}$ inch ovolo sashes, double hung with iron weights, iron axle pulleys, the best large patent lines, and patent spring-fastenings, in deal cased-frames with oak sunk sills; to put all round all the window-frames neat mouldings; and to put to all the windows on the ground-story $1\frac{1}{2}$ inch bead-flush, and bead-butt outside shutters, hung with styles, Redmund's strong rising and falling hinges, and with two strong bolts to each pair of shutters.

External doors, &c.

1057. To put to the front doorway a 2-inch deal moulded and bead-butt six-panel door, hung with a pair of 4-inch butt-hinges, two 10-inch barrel-bolts, a good 9-inch draw-back, iron rimmed lock, with strong brass furniture, and a good ornamental knocker of approved pattern.

1058. To put to the back doorway a four panel 1½ inch bead-butt and square framed door, hung with a pair of 3½ butt-hinges, and a Norfolk thumb-latch, and two 10-inch barrel-bolts.

1059. To put to the privy a ¾ inch deal ploughed, tongued, beaded, and ledged door, hung with a pair of 18-inch cross-garnet hinges, and a small bolt.

Door-cases, &c.

1060. To put to the external doors fir proper door-cases, 4 inches by 4 inches, with grooved beads to the plastering, and with the door posts tenoned into the stone steps, with a piece of 4 lb. milled lead, 15 inches square, wrapped round the foot of each door-post, but neither cut nor perforated so as to admit the penetration of moisture.

1061. To fit up the outside of the front doorway with inch yellow deal pilasters and frieze, and moulded capitals bases and cornice, according to the working-drawings, and all requisite cradling and other proper appertenances.

Internal doors, &c.

1062. To fit up all the internal doorways with four-panel 1½ inch square framed doors, with ¾ inch deal panels, hung with 3-inch butt-hinges and good 7-inch iron rimmed locks with plain strong brass furniture; and to put to all the doorways mouldings to resemble architraves, and all requisite beaded stops and 1¼ inch single rebated linings.

Closets.

1063. To put at the sides of the fire-places of the front parlour and back parlour, dwarf closets, with inch fine Honduras mahogany tops fixed with the requisite bearers, 1¼ inch deal fronts, and 1¼ inch deal square framed folding doors, hung with 3-inch butt-hinges, 5-inch brass flush bolts, and 4-inch good closet-locks, with brass escutcheons; and to put in each closet a shelf of inch deal as wide as the closet will admit of.

1064. To put in each of the other rooms, a closet the whole height from the floor to the ceiling, with 1¼ inch deal square framed fronts and doors, the doors hung with 3-inch butt-hinges and good 5-inch closet-locks with brass escutcheons; and to put in each of the same closets three shelves of inch deal as wide as the closet will admit of.

Staircase.

1065. To construct the staircase according to the working-drawings, with 1¼ inch clean yellow deal treads and linings, inch clean yellow deal risers, strong fir bracketed carriages, 1¼ inch deal beaded string-boards, inch deal wall-strings, blocked circular bottom step, strong moulded deal hand-rail with turned and mitred caps, framed and turned newels 3½ inches by 3½ inches, bar balusters 1 inch square, inch deal apron-linings, and all other fittings and appertenances of every requisite kind.

Dresser.

1066. To put in the kitchen a dresser —— feet —— inches long, with 1¼ inch clean deal top 2 feet wide, two drawers with inch deal fronts and ¾ inch deal dovetailed rims and bottoms, strong legs and bearers, ¾ inch deal pot-board on proper bearers, inch deal cut standards, and three sunk inch deal shelves 8 inches average width.

Privy.

1067. To fit up the privy with inch clean deal cross-tongued seat and riser with proper bearers, and with a turned seat-cover, and to line round the seat with a $\frac{3}{4}$ inch deal skirting 6 inches high.

Fence.

1068. (If the fencing be not of brickwork or of iron, the following description may be inserted.)

To inclose the garden and the fore-court with inch yellow deal pales 4 feet long, $2\frac{1}{4}$ inches wide, not more than 4 inches apart, pointed at the top, and fixed to two arris-rails cut out of fir (or oak as the case may be) $4\frac{1}{2}$ inches by $3\frac{1}{2}$ inches, and with posts not more than 8 feet apart (or nearer, if deemed more proper) of sound old (or new as the case may be) oak, 7 feet 6 inches long, 5 inches by 5 inches, and each with two sound old (or new) oak spurs 4 feet long, 4 inches by 3 inches. The oak posts and spurs are to be thoroughly pitched all over before they are inserted in the ground.

1069. To put in the fence before the front entrance, a gate similar to the paling, framed and hung complete, with stops, a pair of 24-inch cross-garnet hinges, a bolt, and a draw-back lock.

Jobbing-work.

1070. To perform to the house, and to the offices fittings and appertenances thereof, all such carpenter's work and joiner's work as may be necessary thereto in the nature of jobbing.

Ten feet cube of fir extra.

1071. To provide and fix under the contract 10 cubic feet of the best Baltic yellow fir timber in addition to that fully requisite for the completion of the works, to be used in such additional rafters, quarters, joists, or other unplaned timber-work as the Surveyor may direct; the value of all such of the said extra timber-work as may not be directed by the Surveyor to be used is, however, to be deducted from the amount of the consideration of the contract after the rate of per cubic foot; and to provide and fix all additional fir timber which the Surveyor may direct, of the kinds above described, for the like price of per cubic foot.

PLASTERER.

Ceilings, &c.

1072. To lath, plaster, set, and whiten ceilings and strings to every part of the house and of the out-buildings, the coal-house excepted.

Quartered-partitions.

1073. To lath, plaster, and set the whole of the quartered-partitions.

Rendering.

1074. To render and set the whole of the internal brickwork of the house and out-buildings, that to the coal-house excepted.

Colouring.

1075. To colour of such teints of stone-colour as may be directed, the plastered sides of the whole of the house and of the out-buildings, except of the entrance-passage, the staircase, and the front rooms.

CHAPTER I.

1076. *If there be any cornices their description must be inserted; but in houses of this class it is much better to expend the amount of outlay in matters of real and essential substantiality rather than in decoration; thus even this low description of property will become a good and permanent investment for capital, and its soundness will increase the real comfort of the inmates of it.*

1077. If the walls of the house be finished internally with stucco instead of with common plastering, there will be a considerable increase of soundness and of comfort.

PLUMBER.

Gutters, &c. 1078. To line the gutters with 6lb. milled-lead, turned up 9 inches under the slates, and turned up 5 inches next the brick-work, and to put flashings of 4lb. milled lead 4½ inches wide in the brickwork all round the gutters.

Dormer. 1079. To put all round the dormer a flashing of 4lb. milled-lead, 12 inches average width; and to cover the ridge of the dormer-roof with 4lb. milled-lead 15 inches wide.

Frontispiece. 1080. To cover the cornice of the frontispiece to the front entrance doorway with 6lb. milled-lead, turned up 4 inches high against the brick-work, and with a 4lb. milled-lead flashing 4½ inches wide.

Eaves'-guttering. 1081. To put to the eaves of the out-buildings, cast-iron 4-inch trough guttering, put together with white-lead, and securely fixed on strong wrought-iron brackets.

Rain-water-pipes. 1082. To put from the leaded gutter a cast-iron rain-water-pipe 3 inches bore, and from the iron eaves' gutter a cast-iron rain-water-pipe, 2½ inches bore; each pipe is to be securely fixed, with head and shoe complete.

Waste-pipe, &c. 1083. To put from the sink to the drain a 2-inch strong lead waste pipe with a large bell trapped grating.

Laying on water, &c. 1084. To provide and fix in the yard a sound and good wine-pipe, pitched completely on the inside thereof, to serve as a water-butt; to put thereto a ¾-inch deal ledged cover; and to lay on the water to the butt from with a strong lead pipe, ¾ inch bore, and a ball-cock with boss complete; and to put from the water-butt to the sink a ¾-inch lead pipe, with a cock and boss.

PAINTER.

1085. To knot, stop, pumice, and smooth in every part, prepare properly, and paint four times with good and proper oil colour, the whole of the wood-works iron-works and other works usually painted of the whole of the house, and of the offices fittings and appertenances thereof.

1086. The sashes are to be finished dark purple brown; the front door is to be painted green and to be twice varnished with the best copal; all the other painting is to be finished with such teints of stone-colour or drab or other plain colours as the Surveyor may direct; and the number of the house is to be neatly painted upon the front entrance door, and is to be shadowed.

GLAZIER.

1087. To glaze the whole of the windows with good second Newcastle glass, properly bedded, bradded, and back puttied; and to clean and leave perfect the whole of the glass at or immediately before the final rendering up of the house and premises as complete.

PAPER-HANGER.

1088. To prepare properly and hang the whole of the plastered sides of the two front rooms, and of the passage and staircase, with figured paper value 2*d.* per yard, cut close.

(If bordering be required to the papering, a proper description thereof must be inserted).

CHAPTER II.

A SPECIFICATION FOR ERECTING *and completely finishing fit for use and occupation, a* DWELLING-HOUSE OF THE 2*nd* (*or* 3*rd*) RATE, *or class of building, at the corner of two streets within the city of London, to be executed in all respects agreeably to the drawings hereunder enumerated, and according to such further directions, and explanatory drawings, as may be by the architect hereafter given.*

(See 986).

1089. No. 1. Plan of the Basement story
2. Ditto Ground story.
3. Ditto One-pair story.
4. Ditto Two-pair story.
5. Ditto Attic story.
6. Ditto Roof.
7. Elevation of the Eastern front.
8. Ditto Northern front.
9. Section from South to North.
10. Ditto East to West.
11. Details of the external Balustrading.
12. Ditto Principal external Cornice.
13. Ditto Window-dressings.
14. Ditto Shop-front.
15. Ditto Inside of the House.
16. Ditto Balconies.

Notice to District Surveyor, &c. (See § 987.)

CHAPTER II.

BRICKLAYER.

Remove old party-wall.

1090. To take down carefully, and remove from the ground as the Contractor's property, the whole of the materials and rubbish, in the present old party-wall.

1091. If "*the owner or owners, who shall be entitled to the "improved rent of the adjoining building or ground,*" be chargeable with any portion of the expense of a new party-wall, an exact account should be taken of the quantity of brickwork in any old party-wall, and of the quantity of timber in any old timber-partition, which may be removed before the new party-wall is built, in order that the requisite allowance may be made for such old materials, as required by the § 41 of the 14th Geo. III.

Digging.

1092. To dig out the ground for all the foundations, the basement story, the areas, the vaults, the drains, and wherever else may be requisite for the proper performance of the other works; to fill in again properly the ground to the footings, foundations, and other works, and to cart away all the superfluous ground. (See § 988).

1093. To bale out and remove from the foundations all water, which may come into or upon the same, by reason of springs, rain, or otherwise.

Rubbish, &c.

(See § 989).

General Brickwork.

1094. To execute in the very best manner all brickwork requisite for carrying into effect the design of the building and works, according to the drawings and directions of the Architect or Surveyor, including the whole of the party-wall, without the Contractor being entitled to any claim for the value of the moiety thereof, from the party or parties concerned in the adjoining premises. (See §§ 990—1).

Bough Arches.

1095. To turn rough arches, wherever the same can be with convenience effected. (See Index).

Chimneys, &c.

1096. To properly turn parget and core all the flues; to put to each fire-place a 4-inch brick trimmer; the trimmers of the kitchen and laundry are to be carried each the whole length of the West ends of the rooms. (See § 996. *This kitchen was erected on the one-pair story.*)

White Brick Facings and Arches.

1097. To face the whole of the East and North fronts of the building, and the portions of the party-wall chimney-shafts and other brickwork which will rise above the roof, with the best hard white Suffolk (or Essex) bricks, laid in the neatest possible manner with arches (except where there are to be stone-dressings) formed of white bricks moulded to a wedged shape, and dressed over afterwards as practised in the county of Essex and elsewhere. (See § 358 and §§ 570—594).

Cornice, &c.

1098. To put to the upper external cornice a dentil composed of white bricks set on edge, and dressed or ground smooth.

Bedding, &c.

1099. To bed in and point round with lime and hair mortar,

all the window-frames, door-frames, story-posts, and the other works requiring the same; and to lay in mortar all the bond, plates, wood-bricks, templets, and all the other timbers stone-work and other works which are intended to be inserted in the brickwork.

Paving.

1100. To pave the coal-cellar with hard grey stock-bricks laid flat (or on edge as the case may be) in mortar.

Parker's Cement.

1101. To build the three circular area-walls, in 4-inch brick-work, laid in new quick Parker's cement and clean Thames sand, mixed together in equal measures.

Coping.

1102. To cope the wall behind the chimney-shaft, with brick-on-edge, and double plain tile cresting, set in and jointed with Parker's cement and sand, as described for the area-walls. (See § 998).

Drainage.

1103. To construct a barrel drain through the basement-story, according to the plan, and continued into the common sewer: the drain is to be 12 inches bore, and is to be stuccoed on the inside over the lower half thereof, with pure quick Parker's cement ½-inch thick. (See §§ 1001—4).

1104. To put shoots leading into the drain from the rain-water-pipe, water-closets, and each of the areas. (*It is a modern custom to carry rain-water pipes into drains, but this leads to the frequent stoppage of the drainage from the consequent large deposit of dirt.*)

1105. To put in the drain a large stench-trap, set in pure quick Parker's cement. (See Index).

Bricks.

1106. All the bricks (except for the white brick facings) are to be new approved grey stock-bricks, free from soft bricks, place-bricks, or other inferior bricks.

Mortar.

1107. The whole of the mortar is to be compounded in the proportion of one third by measure of the very best Dorking stone-lime, and two thirds by measure of sharp Thames sand, well beaten and worked up together. (See Index).

Grouting.

1108. The whole of the brickwork is to be grouted at every third course, particular care being taken that the facings shall not be stained.

Mode of doing the Work.

1109. No four courses of work are to rise more than one inch exclusive of the bricks. All the external walls above ground are to be scrupulously carried up in Flemish bond throughout their whole thickness, with the heading-bricks carried through both withinside and withoutside; all the other brickwork is to be laid in the manner of English bond. (See §§ 358—365, and 1010).

Reparation of Accidents, &c.

1110. All the walls are to be built level and perpendicular, except where otherwise directed; and should any damage occur to the work by accident, settlement, or otherwise, within twelve calendar months from the completion of the building, the Contractor is to make the same good as shall be by the Surveyor directed.

CHAPTER II.

1111. (The liability of a Contractor to make good settlements, must be taken with great limitation, for they often result from bad design and bad foundation, over neither of which he may have had control: he should be no further liable than for settlements, which are the result of bad materials and workmanship).

Fix Iron safe. 1112. To fix in the brickwork an iron safe, to be provided by ———.

Set Copper. 1113. To set a washing-copper and fittings to be provided by . (See Index).

Cutting, &c. 1114. To cut out for all the various works, as the same may require; and to make good where necessary thereto; to cut all requisite splays and skew-backs.

Jobbing-work. (See Index).

MASON (see §§ 265—295).

3-inch Yorkshire Paving under Foundations. 1115. To put all round beneath the footings of the four principal inclosure-walls of the building, two courses of 3-inch Yorkshire stone, 2 feet average width, with the joints thereof properly wrought and crossed upon each other.

3-inch Yorkshire Paving at the Ground Floor. 1116. To put all along the Northern and Eastern fronts of the building, with the returns thereto, two courses of 3-inch Yorkshire stone paving, with tooled joints and front, and with the top sunk away outside: the stone is to be 18 inches wide to the front part of the building, and 14 inches wide to the other part of the building, in order to suit the widths of the basement-walls; and the requisite mortise-holes are to be cut therein for the story-posts and columns. (See Index for preferable examples of granite in the same situation).

Window-dressings. 1117. To put to the one-pair front window next street, an architrave of the best Portland stone 9 inches by 6 inches, wrought according to the drawings, and with 3 inch Yorkshire paving bond-stones to all the joints, and with copper cramps, each weight 8 ounces thereto.

To put to the three principal one-pair windows, friezes of the best Portland stone 4½ inches thick, and of the dimensions shown by the drawings.

To put to the same three windows, cornices of the best Portland stone, according to the drawings, and to put thereto the enriched consoles of Coade's artificial stone, properly modelled and thoroughly burnt.

Window-sills. 1118. To put to the whole of the windows and blank window-recesses of the two-pair story, sills of Portland stone 4½ inches by 9 inches, properly sunk, weathered, throated, and molded. (See § 1014).

Cornice. 1119. To put to the principal cornice round the fronts of the building, a bed-molding, below the brick dentils, of the best Portland stone 2½ inches by 6 inches, and crown moldings of the best

Portland stone 5½ inches high and 1 foot 7 inches wide, wrought according to the drawings, plugged with lead, and with proper water-joints sunk and run also with lead.

Balustrading.

1120. To put under the balustrading, plinths where shown by the drawings, of the best Portland stone 4½ inches thick; to put the base-mouldings to the pedestals between the balusters, also of the best Portland stone 2½ inches high.

1121. To provide and fix the balusters according to the drawings, of Coade's artificial stone, properly modelled and tenoned at top and bottom into the plinths and imposts.

1122. To put over the balusters, the impost, of the best Portland stone, according to the drawings, scantling 4 inches thick in front, 2 inches thick at the back, and 9 inches wide; the impost is to be plugged with lead, and is to be secured by copper cramps at all the joints therein.

Corbeille.

1123. To put a corbeille of 6 inch Yorkshire stone, to support one of the jambs of the best chamber chimney; the corbeille is to be of the width of the jamb, and is to tail through the whole thickness of the wall.

Chimneys.

1124. To cope the chimney-shafts with the best Portland stone 3 inches thick and 2 feet 2 inches wide, properly weathered and throated; and to put over each flue, a chimney-pot composed of four pieces of 1½ inch Portland stone, cramped together with copper cramps.

Coping to Wing-walls.

1125. To cope the two wing-walls from the chimney-shafts to the fronts, with 3-inch Portland stone, properly weathered and throated, sailing over 1½-inch each way, and cramped with copper cramps.

Marble Chimney-pieces.

1126. To put in the dining-room, a marble chimney-piece according to the drawings, fixed complete, and with a slab, together of the value of 12 guineas.

To put in the parlour, a plain marble chimney-piece with a Portland stone slab, together with the fixing in value five guineas.

Portland stone chimney-pieces.

1127. To put to the kitchen fire-place, a chimney-piece, with 2-inch Portland stone jambs and mantle, 8 inches wide.

To put in the best chamber a neat boxed Portland stone chimney-piece, value £2.

To put to the remainder of the fire-places plain 1½-inch Portland stone jambs and mantles, 5½ inches wide.

Hearths, &c.

1128. To put to the whole of the fire-places back hearths of 2½ inch rubbed Yorkshire stone; to put to the kitchen and to the laundry, foot-paces of 2½ rubbed Yorkshire stone, the whole length of the rooms, and extending 2 feet wide beyond the chimney-fronts.

Slabs.

1129. To put to all the other fire-places, slabs of 1½-inch Portland stone, 1 foot 6 inches wide. (See § 1020).

Yorkshire stone paving in basement.

1130. To pave the whole of the basement-story (except the coal-cellar) with 2½-inch Yorkshire stone, laid in regular courses, with the edges thereof wrought fair through the whole thickness of the stone, and with two sink-stones therein, each sunk and pierced with five holes.

Wine-cellar.

1131. To fit up the wine-cellar with three tiers of the best 3½-inch Yorkshire stone shelves, with upright divisions of the same description of stone between all the compartments, as shown by the plan; the whole of the stone of the wine-cellar is to be wrought with fair tooled edges, and is to be set in new quick Parker's cement.

Basement-stairs.

1132. To construct the two flights of stairs from the ground-floor down to the basement-floor, of the best compact 3-inch Yorkshire-stone according to the drawings.

Coal-plate stone.

1133. To provide and bed in the paving a piece of 3-inch Yorkshire-stone 2 feet square, properly wrought to receive a coal-plate.

Kitchen-sink.

1134. To put in the kitchen a sink of Yorkshire stone 7 inches thick according to the plan, cut out for the waste-pipe and fixed complete.

Cutting out, &c.

1135. To cut out for all iron and other works where requisite, and to clean off the stone-work at or immediately before the completion of the building.

SLATER. (See §§ 542—3.)

CARPENTER AND JOINER. (See §§ 337—340.)

New materials.

1136. To provide materials for and frame and fix carpenter's work and joiner's work sufficient for rendering every part of the house and premises complete, with all requisite ironmongery and brass furniture of the best quality. (See § 1030.)

Timber and deals.

(See §§ 1031—2.)

Hoard.

1137. To put up and maintain such sufficient hoarding and other protection for passengers as may be from time to time required by the proper public authorities. (See index for hoarding and shoring.)

Bond-timber.

1138. To put round in the brick-work of the shop five complete tiers of fir bond-timber in order to receive the wall-linings; and to put all round in each story of the brick-work of every other part of the building (the basement-story excepted) three complete tiers of fir bond. All the bond-timber is to be of scantling 4 inches by 2½ inches, and is to be properly spiked and halved, and is to be lapped 6 inches at the least at all the joins therein. (See § 1038.)

Wood-bricks.

1139. To put the wood-bricks requisite for the lintels and for fixing the finishings of the building.

Lintels.

1140. To put to each of the windows in the 14-inch walls a fir lintel 4½ inches by 9 inches, and 5 feet 3 inches long; to put to each of the other windows a fir lintel 4 inches by 5 inches and 4 feet 9 inches long. (See § 1041.)

Centering.

1141. To provide, fix, ease when so directed, and finally remove, all centerings requisite for the vaults, trimmers, arches, and other works requiring the same.

Battening.

1142. To batten with inch deal the circular wall of the dining-room.

Floors (see § 324).

	Ins.		Ins.
1143. Joists to the ground-story laid upon the iron girders	9	by	2½
Wall-plates to all the other floors	5		4
Joists to all the other floors	10		2½
Trimmers and trimming-joists chamfered away at bottom to afford a proper key to the plastering ...	10		3½
1½-in. yellow deal rebated and filletted floor to the shop.			
Inch yellow (or white) deal (as the case may be) floors of half boards to all the other parts of the house.			

Roof (see §§ 411. 430—448. 520—550. 1047.)

1144. Lower wall-plate upon the joists of the two-pair floor...	6		2½
Rafters to the lower roof at bottom 6 ins. by 2½ ins. at top	4		2½
Two tiers of inter-ties between ditto	3		2
Curb plate...	6		4
Inch yellow deal gutter-boards and bearers with 2½-inch rebated drips and current 1½ inch to 10 feet. (See §§ 520-3.)			
Attic Dormer-window-dressings, according to the drawings, with 1¼-inch yellow deal casings with mouldings, &c., complete, and 1-inch side-linings scribed to the slating.			
Ceiling-joists, spiked in one length	3		2
Five tie-beams	8		3½
Rafters to the upper roof	6		2½
Hips and ridges rounded for lead	8		1½
Angle-ties each 3 feet 6 inches long	5		2½
Circular bearers to hip...	4		1½
¾-inch yellow deal slate-boarding (or battens as the case may be.)			

(For observations relative to curb-roof, see index.)

1145. A dormer with quarters at the sides thereof 4 inches by 2 inches, posts 4 inches by 4 inches, oak sunk sill 4 inches by 3 inches, plates 4 inches by 2½ inches, joists 4½ inches by 2 inches, boarding at the top and side of inch yellow deal, and with a pair of folding 1½-inch ovolo casements (or with inch deal proper ledged and tongued internal and external trap-doors as the case may be) hung with linings frame hinges and 2 bolts complete.

The inside of the dormer is to be lined with ¾-inch deal rebated and beaded linings.

CHAPTER II.

To provide a strong wrought and framed step-ladder for ascending to the roof through the dormer.

Shop-front (see §§ 325—27. 558—569.)

	Ins.	Ins.
1146. Four fir story-posts set in lead (see index for iron sockets and columns)	13	4
Breast-summer	13	15
Stall-board moulded in front	12	3

1¼-inch keyed clean deal fascia with architrave-mould, and cornice with 1½-inch deal brackets, and inch deal cover-board.

1¼-inch clean deal glued blocked and mitred pilasters, with cast-iron bases, and moulded wood capitals with cast-iron enrichments.

Two fluted Ionic columns of 2-inch deal, with cast-iron bases, cast-iron enriched ovolo and volutes, and the other parts of the capitals executed in wood.

1½-inch dado beneath the stall-board, with deal base-mouldings of the same profile as to the pilasters.

2-inch deal chamfered-bar sashes fixed with stops and linings complete.

1¼-inch bead-flush and square framed three-panel shutters, with strong wrought jointed bars, with pins hasps plates rebated corner-shoes and shutter-lifts complete.

¾-inch tongued and beaded linings and backings to the breast-summer story-posts and muntins; and all other fittings requisite for making the shop-front complete.

The dressings of the shop-front are to be continued round the whole of the building, and the part of the front next the parlour is to be cased over with inch yellow deal rusticated and with the dressings as shown by the drawings.

2-inch bead-flush and square framed folding circular sashed shop doors with inch bead-flush and bead-butt shutters, hung in a fir proper door-case 5 inches by 4 inches with transom 4 inches by 3 inches, with three pairs of 4-inch butt-hinges, two bright barrel-bolts, an 8-inch best draw-back lock, and a brass knocker. The shutters of the doors are to have proper wrought-iron corner-shoes stubbs plates and thumb-screws.

Linings to Shop.

1147. To line round the whole of the walls of the shop with ¾-inch yellow deal, matched and beaded, and with the requisite backings.

Dwarf Wainscotting to dining-room.

1148. To line round the dining-room with dwarf wainscotting 3 feet 6 inches high, framed according to the drawings, with 1¼-inch bottom rail 6½ inches high scribed to the floor, inch styles and muntins 4¼ inches wide with small mouldings mitred round the tops thereof to form pilaster-capitals, ½-inch panels, inch top rail 4½ inches wide with capping on the top moulded to form a cornice, and all requisite backings.

Dwarf Wainscot-

1149. To line round the walls of the staircase kitchen par-

ting to staircase kitchen parlour and two-pair story.

lour and two-pair story, with inch square framed dwarf wainscotting 3 feet 6 inches high, with beaded capping and all requisite backings. Note that the dwarf wainscotting is to be continued round the closets.

Wainscotting to Attics.

1150. To wainscot round the whole of the attic story the whole height with inch square framed wainscotting three panels high, with all proper backings.

(This wainscotting was ordered from the views of soundness entertained by the proprietor. For the author's views upon combustible materials see §§ 341—352.)

Skirting.

1151. To put round all such parts of the house as are not described to have wainscotting, inch square skirting 6 inches high.

Framed deal partitions.

1152. To divide off the rooms closets and other parts of the house according to the drawings, with 2-inch square framed partitions. Note that such of the rooms as are to be lined with dwarf wainscotting are to have the partitions framed with their lower panels to range therewith, and to have moulded imposts and cappings to correspond with the imposts and cappings of the dwarf wainscotting. The partitions round the stairs to the basement warehouse are to be 7 feet high and are to be covered over with 1¼-inch rebated and wrought deal to form a bulk-head.

Quartered partition

1153. To put at the end of the dining-room a quartered-partition, according to the drawings, with posts head and sill 4 inches by 4 inches, brace 3 inches by 3 inches, quarters 4 inches by 2½ inches, and three tiers of inter-ties 4 inches by 1¼ inch. (See §§ 544—550, and 1050—51).

Cradling to the recess in dining-room.

1154. To form and fix for the arched head of the recess in the dining-room, cradling of inch deal in two thicknesses, with proper crown-piece and stays.

Arch, &c., on the two pair landing.

1155. To form the arch on the two-pair landing, and to put beneath the same, pilasters according to the drawings.

Angle staves

1156. To put at the angles of the recess in the dining-room, and to the jambs of the kitchen and parlour fire-places, rebated and beads angle-staves; to put at all the other angles of the chimneys square angle-staves.

Private door.

1157. To put to the private entrance a 2-inch four-panel, moulded and bead-flush door, hung complete in a fir proper door-case 4 inches by 5 inches, with hinges and fastenings as to the shop doors; to line round the door-way, with inch tongued and headed deal.

Dining room folding doors

1158. To put to the dining-room a pair of folding doors, framed and moulded according to the drawings, the part thereof forming the room entrance-door is to be 2 inches thick, the fixed part of the door is to be 1½-inch thick, the room-door is to be hung with a pair of 4-inch butt hinges and a best mortise-lock, with plain brass furniture.

Closet doors to dining room

1159. To put to the two closets in the dining-room 1½-inch

four-panel moulded and square framed doors, hung complete each with a pair 3½-inch butt-hinges, and a good iron rimmed lock with plain brass furniture.

Two-pair room-doors.

1160. To put to the whole of the rooms of the two-pair story, 2-inch moulded and square-framed doors, hung complete with 4-inch butt-hinges, with a best mortise-lock with plain furniture to each.

Basement doors.

1161. To put to the basement story 1½-inch four-panel bead-butt and square-framed doors, hung complete with 3½-inch butt-hinges, and 7-inch stock-locks, in oak-door-cases 4 inches by 4 inches: to fit up the coal-cellar doorway, with inch coal-boards 4 feet 6 inches high, in proper slides.

Other doors.

1162. To put to all the remainder of the rooms closets and other parts of the house, 1½-inch four-panel square-framed doors, hung with 3½-inch butt-hinges, a good dead-lock to each of the closets, and a 7-inch best ironrimmed brass knob lock, with plain brass furniture to each of the other doors: the water-closet is to have in addition a small bolt.

Door-linings, grounds, architraves, &c.

1163. To put to all the doors requiring the same 1¼-inch single rebated linings, and inch framed grounds 4½-inch wide; and to put round all the doors mouldings to form architraves according to the drawings.

Dwarf closets in parlour.

1164. To put in the parlour two dwarf closets, with 1¼-inch moulded folding doors, hung in beaded fronts, with 2½-inch butt-hinges, and with two bolts and a good lock to each closet: to cover each closet with inch Spanish mahogany, moulded in front, and skirted over with ½-inch moulded Spanish mahogany 4 inches wide; and to put in each closet a shelf of inch deal, 10 inches wide.

Shelves in closets.

1165. To fit up all the other closets, each with four tiers of inch shelves all round three sides of each closet, the lower shelf round the store-closet is to be 12 inches wide, all the other shelves are to be 8½ inches wide.

Fan-lights.

1166. To put over the two outer-doors, 2-inch deal moulded fan-lights, according to the drawings.

Dining-room windows.

1167. To put to the two windows of the dining-room, 2-inch astragal and hollow sashes, double hung with brass axle-pulleys, large patent lines, iron weights, and patent spring fastenings, in deal cased frames, with oak sunk sills.

1168. To fit up the two windows with 1½-inch sunk and beaded boxings with mouldings laid round the same in order to form architraves, inch return linings at the sides of the boxings, inch three-panel bead-butt back-linings, 1¼-inch shutters three panels high moulded in front and hung with hinges complete in one height and prepared to hang in two heights, 1¼-inch moulded soffits, backs and elbows, beaded cappings, and 30-inch spring shutter-bars.

Other windows.

1169. To put to all the other windows throughout the house, 1½-inch ovolo sashes, double hung with brass axle-pullies, large patent lines, iron weights, and spring fastenings, in deal cased-frames with oak sunk sills: to put round all the same windows inch deal tongued linings, with inch deal grounds 4 inches wide, with moulding laid round the same, in order to form architraves. The blank sashes are to be fitted up to resemble the other windows.

Outside shutters to parlour.

1170. To put to the parlour-windows 1¼-inch two-panel outside shutters, framed bead-flush on both sides, and hung complete with styles and 5-inch Redmund's rising and falling hinges.

Mantle-shelves.

1171. To put to all the plain chimney-pieces, mantle-shelves of inch deal, moulded, 6½ inches wide.

1172. (If incombustible mantle-shelves be preferred, they may be made of Portland stone).

Upper water-closet.

1173. To fit up and complete the upper water-closet, with inch square framed Spanish mahogany riser, inch pencil-cedar seat, inch mortise-clamped Spanish mahogany frame and flap, with moulded nosing, and the flap hung with brass hinges: to put in the closet at the side of the water-closet, a dove-tailed cistern of 1¼-inch deal, as large as the situation will admit: to put neat casings to conceal the pipes; and to provide and fix to the water-closet all other requisite fittings: to put in the water-closet a neat mahogany small shelf, with mahogany edging 3 inches wide. To put in the closet adjoining to the water-closet a sink of 1¼-inch deal, with a sliding shutter front, hung with weights and lines, and a dwarf 1¼-inch square-framed door, under the sink, hung with 2½-inch butt-hinges, and a brass turn-buckle.

Lower water-closet.

1174. To fit up the lower water-closet with 1¼-inch deal seat riser and clamped flap, the flap hung with hinges and all other proper work complete.

Stair-case.

1175. To construct the stair-case according to the drawings, with 1¼-inch clean deal treads landings, and risers with molded returned nosings, strong bracketed carriage, 1½-inch wall-string, 1¼-inch sunk beaded cut and mitred outer string-board, bar dove-tailed balusters 1⅜-inch square (each tenth baluster of wrought iron), Spanish mahogany moulded handrail, with ramps and scroll, and curtail bottom step to the stairs.

Dresser.

1176. To provide and fix in the kitchen, a dresser complete with 1½-inch clean deal top, two drawers with locks and brass-drop handles, inch deal pot-board with bearers, and inclosure beneath the dresser, with a pair of 1¼-inch square framed folding-doors, with a bolt and a brass turn-buckle; to put over the dresser four tiers of inch deal sunk shelves 9 inches average width, 1¼-inch framed and cut standards, and moulded fascia at the top.

Cistern.

1177. To put in the kitchen a cistern-case, of 1¼-inch deal dovetailed, as long as the situation will admit, 2 feet 6 inches wide inside, and 2 feet 9 inches deep inside: to put to the cistern the

requisite bearers, and a cover of ¾-inch deal, ledged and with a wood handle.

Plate-rack. 1178. To put under the cistern a proper plate-rack complete, as long as the situation will admit.

Dust-bin. 1179. To put in the space at the foot of the basement-stairs a dust-bin complete, of 1¼-inch deal, with sliding door in front, ledged ¾-inch trap-door hung complete, and a sieve with handle and proper runners.

Sundries. 1180. To fix all the iron-work; to provide and fix all requisite beads, stops, grounds, fillets, tilting-fillets, blocks, and other fittings and work requisite for completing the whole building, and the appertenances thereof. (*For more enlarged clauses, see Index*).

Jobbing-work. (See Index).

SMITH.

Chimney-bars. 1181. To put to each of the fire-places a wrought-iron chimney-bar 2½ inches by ½ inch, properly corked at the ends thereof.

Four girders and iron wall-plate. 1182. To put to the ground-flooring, four cast-iron girders average scantling 9 inches by 3 inches, laid upon a cast-iron chain-plate 3 inches by 1½ inch, continued all round the four principal walls. (See § 324.)

(For example of wrought-iron wall-plates see index. Wrought-iron in such a situation is most tenacious, but cast-iron will be least likely to corrode.)

Bolts to brick-trimmers. 1183. To put four 1-inch bolts with nuts and washers, to prevent the brick-trimmers of the kitchen and laundry from spreading.

Cast-iron columns. 1184. To put under the breast-summers, four cast-iron columns 3½ inches square, with caps and plates at top and bottom 1 foot 6 inches by 1 foot and 1¼ inch thick.

224lbs. ties, &c. 1185. To provide and fix 224 pounds avoirdupoise of wrought-iron ties bolts and straps, to secure the breast-summers floors and roofs. (See index for other clauses).

Area-gratings. 1186. To provide and fix over the areas, 3 cast-iron gratings according to the drawings, with frames 1⅛ inch square, filled in with bars 1⅛ inch by ⅝ inch, not more than 1½ inch apart; the gratings are to be run with lead into the paving. (See Index.)

6-inch cast-iron rain-water-pipe. 1187. To provide and fix a complete stack of 6-inch cast-iron rain-water-pipe, to lead from the roof down into the drain, with head and shoe complete.

(This pipe served the whole roof; if more than one pipe be used a smaller bore will suffice.)

Coal-plate. 1188. To provide a cast-iron plate with proper fastenings for the coal-shoot.

Four Balconies. 1189. To provide and fix at the one-pair windows, four ornamental balconies of cast-iron according to the drawings.

Bells. 1190. To provide and hang with cranks wires and all proper appertenances complete, the following bells, viz., three bells in the kitchen, with one lever-pull in the parlour, two lever ornamental pulls in the dining-room, and a pull in the best chamber; to provide and hang another bell in the servant's chamber, with a pull in the best chamber; and to provide and hang within the kitchen two bells with pulls thereto, one from each external door; and to put written labels to all the bells.

Night-bolt. 1191. To put to the best chamber, a good brass night-bolt hung with pull and all proper appertenances complete.

PLASTERER.

Floated ceilings. 1192. To lath plaster float set and whiten ceilings and strings throughout the house.

Render float and set. 1193. To render float and set the walls of the one-pair and two-pair stories above the wainscotting.

Troweled stucco. 1194. To execute in floated troweled stucco the brick-work of the staircase kitchen and parlour above the dwarf-wainscotting. (See Carpenter's work.) (See § 1077.)

Lathing, &c. 1195. To lath all the quarters and other parts so requiring, and to plaster float and set the same.

Enriched cornice, &c. 1196. To execute according to the drawings and whiten the enriched cornice of the dining-room.

1197. To execute the arched ceiling over the recess in the dining-room, forming the same into one panel by a sunk enriched bead $\frac{3}{4}$-inch wide.

Lime-whiting. 1198. To lime-whiten twice all the unplastered brick-work of the basement-story, and of the cellars and areas.

Sundries. 1199. To run and execute all requisite beads quirks and arrises.

PLUMBER.

Gutters. 1200. To lay the gutter-boards with milled-lead, weight $6\frac{1}{2}$lbs. to the foot superficial, turned up 5 inches high next the brickwork and 9 inches wide next the rafters, and to put thereto flashings of 4lb. milled-lead 5 inches wide.

Step-flashings, &c. 1201. To put at the heading and sides of the roof, flashings of

4lb. milled-lead 11 inches average width, set step-wise to the raking parts of the roof.

Flashing to curb-plate.

1202. To put at the curb-plate of the roof a flashing of 4lb. milled-lead 10 inches wide.

Covering of hip.

1203. To cover the circular corner hip with 4lb. milled-lead according to the drawings.

Covering of Attic windows.

1204. To cover the attic window-heads with 6lb. milled-lead 9 inches wide.

Dormer.

1205. To cover the top and sides of the dormer with 6lb. milled-lead turned down 6 inches over the slating; and to put at the foot of the dormer-door an apron of the same description of lead 12 inches wide.

Copper eaves'gutter and pipe.

1206. To put round the eaves at the curb-plate 3-inch copper guttering fixed with bands and brackets complete, and with two 2½-inch copper pipes leading into the gutter below, with neat heads and proper shoes.

Covering of shop-front, &c.

1207. To cover the shop-front with 6lb. milled-lead turned up 6 inches high against the brickwork, and with a flashing of 4lb. milled-lead 5 inches wide let into the brick-work.

Upper water-closet.

1208. To construct and fit up the upper water-closet in every respect complete, with the very best patent valve closet apparatus, 8lb. lead funnel-pipe 4½-inch bore leading to the drain, with proper tusks, strong D trap, lead box 10 inches long 7 inches wide and 6 inches deep of 10lb. milled lead, inch supplying pipe to basin, wire, pipes, cranks, and other proper work fittings and appertenance; to line the cistern, the sides thereof with 5lb. milled-lead and the bottom thereof with 8lb. cast-lead, and to put to the cistern an 1¼-inch waste-pipe soldered below the dip, with washer and waste complete. (*For other examples of water-closets see Index.*)

Lower water-closet.

1209. To put to the water-closet in the basement-story, a strong cast-iron trapped basin (or a white earthen basin as the case may be) fitted up and made in all respects complete.

Two sinks by stairs.

1210. To line the two sinks adjoining to the staircase with 6lb. milled-lead, and to put thereto 2-inch waste-pipes with brass-bell traps complete.

Kitchen cistern and sink.

1211. To line the kitchen cistern, the sides thereof with 5lb. milled-lead and the bottom thereof with 8lb. cast-lead; to put thereto an 1¼-inch waste-pipe and to fit up the kitchen sink with a 2-inch strong waste-pipe leading into the rain-water-pipe and with brass bell grate complete; to put from the cistern to the sink a ¾-inch service-pipe and a brass cock.

Lay on water.

1212. To lay on the New River water (or other water as the case may be) with ¾-inch strong cast-lead pipe to the cistern of the upper water-closet, and with ball-cock complete; to the lower water-closet with cock and brass drop-handle complete; to

the two sinks by the stairs with cocks complete; and to the cistern in the kitchen with cock and ball complete; and to pay all such fees and charges consequent upon the laying on the water.

PAINTER.

Five times on the iron-work.

1213. To paint five times with the best oil-colour all the iron-work of every description belonging to the premises, the first two coats thereof being done with red-lead paint.

Four times on the wood-work.

1214. To knot, stop, prepare properly, and paint four times with the best oil-colour, the whole of the wood-work, stucco-work, and the other works throughout the premises which usually are painted.

Flatting and colours.

1215. To flat extra the dining-room and the best chamber with three teints of colour.

The whole of the sashes are to be finished outside dark purple brown; all the outside shutters and doors are to be finished in three shades of green; the other painting is to be finished of such teints of stone-colour, drab, or fawn-colour, or of other plain colours, as the Architect or Surveyor shall direct.

Graining.

1216. To grain extra in the best manner in imitation of wainscot, and varnish twice with strong copal varnish, the whole of the doors within the house on the ground-story thereof, and all the sides next the kitchen and staircase of the doors on the one-pair story thereof.

GLAZIER.

Ground glass.

1217. To glaze the closet-window with ground glass of good quality.

Best glass.

1218. To glaze the shop-windows and the windows of the dining-room with the very best Newcastle crown glass.

Second glass.

1219. To glaze all the remainder of the windows and lights throughout the house with good second Newcastle crown glass.

1220. All the glazing is to be properly bedded bradded and back puttied, and is to be cleaned and left perfect at the rendering up of the premises as complete.

PAPER-HANGER.

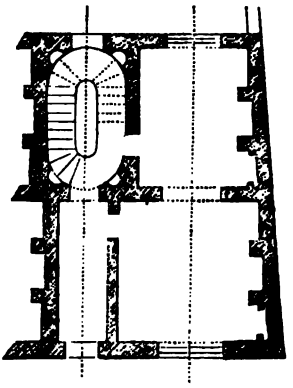
Dining-rooms, paper 12*d.* underlining and gilt moulding.

1221. To paper the dining-room with figured paper value 12*d.* per yard, with an underlining paper, and with a gilt moulding one inch in width put all round the edges thereof.

Paper 4*d.* border 1*d.*

1222. To paper the whole of the two-pair story and the closets of the one-pair story with figured paper value 4*d.* per yard, with border at top and bottom value 1*d.* per yard.

CHAPTER II.



1223. Considerable beauty of effect may be added to ordinary town-houses by placing the centre-line of the staircase corresponding with the centre-line of the passage, by which means if the front room be united by folding-doors to the back room, the exact uniformity of both rooms will be preserved: a whole row of houses may be built in this manner without loss of room and without additional expense.

1224. Frequently a whole row of houses is built upon a plot of ground the angles of which are oblique, and from the party-walls being made to follow the lines of the ground every angle of every room in every house follows the obliquity of the ground-plot.

1225. This vice is not confined to London houses. Sebastian Serlio, in the 68th cap. of his 7th book, has the following condemnation of this vice: "Si come ho detto più a dietro, ho ueduto "in più Città d'Italia, & in altri paesi anchora, di molte case in "una strada nobile, le quali son tutte fuor di squadro, e cosi "anchora tutte le stanze essere in quel modo fuor di squadro, "accordandosi con la muraglia principale della strada. LA QUAL "COSA E BRUTTISSIMA & INCOMPORTABILE."

1226. The mode of arranging houses mentioned in § 1223, will in general remove the irregularity and defects deprecated by Serlio and described in § 1224, and thus the natural defects of the ground-plot may be rendered subservient to beauty.

CHAPTER III.

SPECIFICATION *for works to be done according to a set of Working-drawings signed with and forming part of the Contract for in the erection of a* FIRST-RATE DWELLING-HOUSE *with offices thereto belonging, on a plot of ground situate and being the site of the house and premises No. and in the entire completion thereof fit for use and occupation in all respects, except the Plumbing Glazing and Painting of the said intended Dwelling-house and of the offices thereof, the works in which three trades are intended to be specially excepted from the Contract.*

(*Here to follow the list of Working-drawings.*)

BRICKLAYER.

Notices, &c., to District-surveyor, &c.

1227. To give to the District-surveyor, a proper notice for the erection of a first-rate building, to give to him all other requisite notices, and to pay to him his proper official fees.

To obtain from the Commissioners of Paving, the Surveyor of Pavements, and the Commissioners of Sewers, all requisite licences and permissions to erect hoards and scaffolds, and for making areas and for entering the public drains; and to pay all proper official fees and charges attendant upon obtaining such licences and permissions.

Pulling down old materials, &c.

1228. To take down and break up all the old brickwork on the site of the intended new works; to clean and stack up such of the old bricks not exceeding in number 10,000, as may remain sound and fit to be again used; and to remove and cart away immediately from the premises all the other old bricks. (See § 1091.)

Digging, &c.

1229. To clear away from the site of the intended new works, all the old foundation-walls and other impediments; and to excavate the ground for the basement-story, the foundations, the areas, the drains, the floors, and all the other works which may so require; to render level and hard the bottoms of all the trenches, and to fill in and consolidate properly the ground about all the footings, basement-walls, drains, and other works; and generally to work, fill up, remove, and level the ground in and about the intended new works and the site thereof as shown by the drawings and as shall be found requisite. (See § 988.)

Rubbish, &c.

(See § 989.)

Lime-core.

1230. To spread under the floor of the back part of the shop and all round against the outside of the basement against which the ground would otherwise lie, a layer of lime-core full 6 ins. thick.

General brickwork.

(See §§ 990—1, and index.)

Party-walls.

1231. The Contract is to include only such portions of the

party-walls as will belong when done to , and is to include no portion of the moiety of any party-wall which from the foundation to 18 ins. above the adjoining roofs will belong to any adjoining building, and where any of the adjoining buildings rise higher than the intended new building the contract is in such case to include only a moiety of the new walling from the foundation to 18 ins. above the roof of the new building, but these exceptions are not intended to exclude from the contract any portions of the chimney-shafts.

(For cases where the whole of the party-walls are included in the contract see § 1094.)

South and West walls.

1232. To take down and remove the defective and insufficient parts of the South and West walls, to raise the same walls to the height shown by the drawings, and to rake out, repair thoroughly, and point neatly the remainder of the said walls.

Gauged arches.

1233. To put to the heads of the two niches, also to all the openings above the ground-story in the principal front next , and to the three openings in the wall on the North side under the gateway, the very best gauged arches according to the drawings accurately cut and set. (See §§ 570—594.)

Uncut arches.

1234. To turn neat uncut arches over all the other internal and external openings throughout the building, tuck-pointed on the outside; and to turn counter-arches and discharging-arches in the building wherever the Surveyor may so direct.

Facings.

1235. To face the Eastern front of the building next S—— —— with the very best hard second malm stock-bricks matched to a light uniform colour, and finished in the neatest possible manner in Flemish bond with flat joints. (See § 358).

rick cornice.

1236. To execute according to the drawings in the best hard malm stock bricks, the front parapet-cornice, with shaped bricks, the whole thereof being accurately and neatly rubbed and set, each pair of bricks forming the trusses or blocks, being secured by a long ⊢ shaped copper cramp, and a piece of strong copper wire being also let into each end of each of the bricks forming the blocks, and also into the stone-work of the cornice.

himneys.

1237. To properly turn parget and core all the flues; to put to the kitchen fire-place a chimney-bar of wrought-iron 3½ ins. by ⅝ in. and to put to each of the other fire-places, a chimney-bar of wrought-iron 2½ ins. by ½ in. each chimney-bar is to be properly corked at the ends thereof.

1238. To put over each of the fire-places, a first sized chimney-pot set in tiles and Parker's cement.

1239. To put to each of the fire-places, a trimmer of 4-in. brickwork 18 ins. wider than the chimney-opening.

opper, &c.

1240. To provide and set in the scullery with fire-bricks, strong wrought-iron furnace-bars door and frame, and all other

proper appertenances, a strong washing-copper of the size shown by the plan.

Tile cresting, &c. in Parker's cement.

1241. To finish the party-walls, chimney-shafts, parapets, and other walls which are not intended to have stone copings, with double plain tile cresting and brick-on-edge both set in and jointed with new quick Parker's cement and clean Thames sand mixed together in equal measures.

1242. To finish the barge gable over the South side of the principal roof with stepped salient-courses as shown by the drawings.

Indents

1243. To cut and parget where requisite in the old brickwork proper perpendicular indents, to receive the intended new brickwork, and to make good in a workmanlike manner all damage caused by cutting the indents.

Cutting.

1244. To cut and rub all such splays and chamferings as may be requisite in order to complete the building according to the drawings.

Bedding.

(See § 999.)

Cross walls.

1245. To build cross walls as shown by the drawings, under the timber-floor of the back part of the shop, and under the quartered-partition between the stable and the chaise-house; the upper four courses of work under the said quartered-partition are to be set in Parker's cement and clean Thames sand mixed together in equal measures.

Brick paving.

1246. To pave with hard stock-bricks laid flat in mortar and grouted also between the joints with liquid mortar, the stable, the chaise-house, and the whole of the basement-story including the areas.

(The basement-story of this house was devoted to cellarage.)

Brick-nogging.

1247. To brick-nog with 4-in. brickwork the quartered-partition between the stable and the chaise-house.

To brick-nog with bricks set on edge, the whole of the quartered-partition on the South side of the principal stair-case, and the quartered-partitions at the back of the recess in the best room on the one-pair story, and that on the East side of the water-closet lobby.

Drains, cess-pool, &c.

1248. To construct to the privies a cess-pool, 3 feet internal diameter, and 12 feet deep, steined round with brickwork, set in Parker's cement, and stuccoed all over on the inside thereof $\frac{3}{4}$-in. thick, with pure Parker's cement.

1249. To construct according to the plan, and continued to the common sewer a barrel-drain, 14 ins. internal diameter, and to stucco the same on the inside over the lower half thereof, $\frac{3}{4}$-inch thick, with pure Parker's cement.

1250. To put from the cess-pool, also from the stable, and from the rain-water-pipe by the chaise-house, barrel drains 9 ins.

bore, leading to the principal drain, and stuccoed on the inside as the other drain.

To put at the feet of the soil-pipe and rain-water pipe, brick funnels set in Parker's cement. (See § 1104).

Reparation, &c., of old South party-wall.

1251. To repair, make good, render as uniform as possible, and flat-joint-point with stone-lime blue mortar to the height of 19 feet from the ground, the portion which is not intended to be rebuilt of the North party-wall of the house.

10 cwt. iron-hooping.

1252. To provide and work up in the chimneys, and other brickwork, 10 cwt. of wrought-iron vat-hooping.

2 rods extra brickwork.

(See § 1007.)

Bricks.

(See § 1008.)

Mortar.

(See § 1009.)

Mode of doing the work.

(See §§ 353—65, and § 1010.)

Lime-whiting, &c.

1253. All the interior work of the basement story, of every part of the shop, of the stable, the chaise-house, and the loft, is to be finished completely fairly, and is to be twice lime-whited.

To lime-whiten twice also the unplastered timbers and boarding of the underside of the one-pair flooring, and of the leaded flat, and also of the basement flooring. (The ground story was to be used principally as a warehouse).

Iron curb and railing.

1254. To inclose according to the drawings, the leaded flat over the loft, along the front parapet thereof, with cast-iron curb, wrought-iron rail 2½ ins. by ½ in., wrought-iron standards 1 in. square, and cast-iron bars ¾ in. square, fitted up, fixed, run with lead, and made complete. (The iron-work is not separated from the other works, in this specification).

Scaffolding.

1255. To provide and fix all scaffolding, which may be requisite for the performance of the whole of the works of every kind, including the plumber's work of the intended dwelling-house, and of the offices and appertenances thereof, with sufficient poles, putlogs, boards, ladders, and other things proper and requisite thereto.

Jobbing-work.

(See § 1011.)

MASON (see § 265—295).

Granite sill.

1256. To put along the principal front, under the story-posts and iron-columns, two pieces of parallel square Aberdeen granite curb scantling 12 ins. by 9 ins. each, feet, ins. long, fine worked where in sight, and cut out to receive the bases of the columns and story-posts.

Steps.

1257. To put to the four external doorways of the dwelling-house, the best tooled solid Yorkshire stone steps 7 ins. by 13 ins.,

properly back-joluted, with mortise-holes to receive the bottoms of the door-posts, and with the projecting corners rounded off as shown by the plan.

2 niches.

1258. To put to the two niches in the principal front of the dwelling-house, circular moulded pedestals of Portland stone, according to the drawings.

String-course, &c. of Portland stone.

1259. To provide and fix under the front windows of the two-pair story, the string-course of the best Portland stone 9 ins. by 6 ins., the sills of Portland stone 9 ins. by 9 ins., and the two tablets of Portland stone 6 ins. thick; the whole of this stone-work is to be wrought according to the drawings, to be weathered and throated, and to be plugged with lead at the joints thereof, and the tablets are to be secured each by three strong 12-in. copper cramps.

Window-sills.

1260. To put to the two front windows over the gateway, sunk weathered and throated sills of Portland stone, scantling 4 ins. by 9 ins.

To put to all the other windows of the dwelling-house and offices, sills of 3-in. Yorkshire paving stone wrought with fair edges and ends, throated, and laid sloping. (See § 1014).

Cornice coping, &c.

1261. To execute the level and raking cornice, inclosing the pediment of the principal front of the dwelling-house according to the drawings, of Portland stone scantling 18 ins. by 6 ins., with proper raised sunk water-joints, channeled and run with lead, and with solid apex and angle stones, the sunk bed-moulding to be mitred round each block or truss; to put under the same, brick blocks or trusses, and a plain throated and weathered string-course of Portland stone, 3 ins. by 6 ins.; and to put to the parapet above the gateway, Portland stone coping scantling 15 ins. by 3 ins., throated and run with lead at the joints therein.

Blockings and attic-windows.

1262. To execute in solid Portland stone according to the drawings, the blockings, and the four pilasters the fascia the pediment and the finial of the larger front attic-window, and the architrave of the smaller front attic-window, the stones thereof being secured together by copper cramps, each weight 8 ounces.

Landing under water-closet, &c.

1263. To provide and fix for the support of the water-closet, and the lobby thereof, a piece of the best tooled Yorkshire stone-landing, 8 feet 6 ins. long, 3 feet 6 ins. wide, and 3½ ins. thick, wrought with fair and chamfered outer edges, and with the projecting angle thereof rounded to the shape of the water-closet.

1264. In modern construction a fatal error is often committed, by erecting masses of building upon layers of stone which bear falsely, and which the superincumbent mass consequently fractures: if walls be erected upon such layers of stone, there should be arches between the stone and the walls, the segmental spaces beneath the arches being left open altogether, or only closed after settlement of the work has ceased, and then by only very thin work with a great deal of mortar between it and the arches: moreover, these arches should only bear upon the direct

points of support: the author lately pursued with complete success this method, adopting also the contrivance mentioned in § 568. Thus two arches lying at right angles to each other met and rested upon one iron column, with one common skew-back thereon, round which the iron ties were passed both ways.

Corbeilles to kitchen chimney.

1265. To put under each of the jambs of the kitchen-chimney, a corbeille composed of a piece of square granite curb, 12 ins. by 8 ins., and 2 feet 6 ins. long.

Landing for Scullery-chimney, &c.

1266. To put for the support of the scullery-chimney, and to form a hearth and slab thereto, a piece of 3-in. Yorkshire stone, 4 feet long, 3 feet 4 ins. wide, and with the outer edges thereof wrought and chamfered fair.

To put for the support of the chimney-shaft of the counting-house, a piece of 4-in. Yorkshire stone 2 feet 6 ins. long, and 2 feet wide, tailed upon the back breast-summer.

1267. Wherever chimneys or other masses projecting from walls, are supported upon corbeilles or landings of stone, the brickwork should be corbeilled out gradually in courses beneath the stone-work, in order to prevent the stone-work from snapping off. (See § 1264.)

Chimney-pieces, &c

1268. To put to the principal kitchen chimney, jambs and mantle each of 2 in. Portland stone, 10 ins. wide.

To put to the scullery chimney, and to the chimney of the lesser kitchen, jambs and mantles each of 2-in. Portland stone, 6 ins. wide.

To put to the best room on the one-pair story, a blue and white veined marble chimney-piece, made according to the drawings, no part thereof being of marble less than one inch in thickness.

To put to each of the four other fire-places in the North party-wall of the dwelling-house, a boxed chimney-piece of Portland stone according to the drawings, no part thereof being of stone less than 1¼-in. thick. To put over the chimney-bar of each of the same four fire-places, a piece of 4-in. Yorkshire stone 7 ins. wide, 3 feet 6 ins. long, and chamfered away at the back, so as not to check the ascent of the smoke.

To put to all the remainder of the fire-places, jambs mantles and shelves, each of 1¼-in. Portland stone, 6 ins. wide.

Hearths and slabs.

1269. To put to the whole of the fire-places, hearths of 2½ in. rubbed Yorkshire stone.

To put to the fire-place of the best room on the one-pair story, a slab of blue and white veined marble one inch thick; and to put to all the other fire-places hearths of 2-in. Portland stone.

To provide and fix under the copper, a hearth of 3-in. Yorkshire stone containing 12 feet superficial.

Paving, &c., in the shop.

1270. To pave the Western part of the shop to the extent shown by the drawings, with the best 2½-in. Yorkshire stone wrought fairly all through the thickness of the stone, close-jointed, and laid in regular courses upon 4-in. cross walls 9 ins. high, and

to cover the top of the shop chimney-breast with similar stone 18 ins. wide.

(This was for the reception of a melting furnace.)

Paving to small yard and privies.

To pave the two privies and the small yard adjoining thereto, each with one piece of 2½-in. Yorkshire stone.

Floor-landing to passage.

1271. To put to the entrance-passage on the South side of the gateway, a floor of 3 in. tooled Yorkshire stone, let into the brickwork in pieces as large in size as possible.

Make good public paving.

1272. To pay to the Commissioners of paving, the expense of making good the paving which will be injured or disturbed by the execution of the intended works.

Sinks.

1273. To provide and fix in the scullery and small kitchen, two sinks as shown by the plan, of Yorkshire stone 7 ins. thick, with proper bearers, and with holes cut out for the pipes and traps.

Jobbing-work, &c.

(See § 1022.)

SLATER (see §§ 542—3).

Countess slating.

(See § 1023.)

Bond, &c.

(See § 1024.)

Reparation.

(See § 1025.)

(See § 337—40.)

CARPENTER, JOINER, SMITH and IRONMONGER.

New materials, &c.

1274. To provide sufficient new materials for, and frame fix and finish all carpenter's work and joiner's work, which may be requisite for carrying into effect, and for completing in every respect the intended dwelling-house, and the offices and appertenances thereof according to the design.

Ironmongery, &c.

(See Index.)

Timber and deal.

(See § 1031 and Index.)

Old timber.

1275. Any portion of the old timber at present on the premises, which may remain sound and good, and of the proper description according to the specification, may be used in the new work.

Hoarding.

1276. To provide and fix strong hoarding, sufficient to inclose the ground during the time the work is being carried on.

(See Index for hoarding and shoring).

Sundries.

(See § 1033 and Index.)

CHAPTER III.

4 cwt. iron ties, &c.

1277. To provide and fix in and about the intended building, 448 lbs. avoirdupois of wrought-iron in such straps, ties, screw-bolts, and other light wrought and hammered work, as the Surveyor may direct; all additions to the said quantity, and all deductions therefrom, are to be taken after the rate of per pound avoirdupoise, including the fixing thereof.

Centering.

(See § 1141, and Index.)

Bond-timber and wood-bricks

1278. To put in the brickwork, the following fir bond-timber scantling 4 ins. by 2½ ins., properly lapped and spiked together in lengths as great as possible:

All round in the brickwork of the shop, and round the South entrance-passage, three tiers.

All round every other part of the internal brickwork of the dwelling-house and offices, two tiers in each story.

To put all wood-bricks requisite for fixing the skirtings of the ground story, and for receiving the other finishings and works so requiring.

Lintels.

1279. To put over the window of the principal kitchen, a lintel extending from the North party-wall, of fir 18 ft. 10 ins. long, scantling 9 ins. by 9 ins. with a return of similar sized timber 7 feet long, halved thereto, and extending round the South-side of the staircase.

To put over the window of the room above the principal kitchen, a lintel of fir 13 feet long and 9 ins. square.

To put over the openings in the building, lintels and filling-in-lintels, wherever else requisite, each 5 ins. high, 18 ins. longer than the bearing, and of the width of the brickwork.

(See § 1041.)

Ground-flooring.

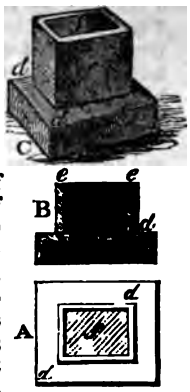
1280. To construct the ground-flooring according to the drawings, with six fir girders each 18 ft. 6 ins. long, and scantling 10 ins. by 8 ins.,—five oak sleepers or plates, and oak side wall-plates under the girders, 4 ins. by 4 ins. and fir joists 7 ins. by 2½ ins.; and to lay the whole of the timber-floor of the ground-story with 1½ in. deal rough boards, clear of sap-wood, ploughed and tongued, with wrought-iron 1¼ in. by ⅛ in.; the ends of the girders, and the other timbers of the flooring which will lie against the ground, are to be thoroughly pitched over to prevent the effects of rot; a portion of the shop-flooring is to be ledged, and to be hung with strong joints and flush rings, in order to form a pair of large folding trap doors.

1281. For the heads of timbers which are to be inserted in the damp brickwork, which lies near the ground, sockets of cast-iron are to be recommended: and example of pitching the ends of the timbers is here given, principally for reprehension on account of its combustible nature. (See § 324.)

Breast-summers story-posts, columns, &c.

1282. To put under the girders of the ground-floor, six fir-framed and chamfered story-posts 6 ins. square, each with an oak corbeille 6 ins. by 6 ins., and 2 ft. 6 ins. long, and a box socket of cast-iron ⅜ in. thick, extending 9 ins. high up the post, and with an iron plate-base cast thereon, 15 ins. square, with a rim

extending all round 2 ins. down over the brick pier*.



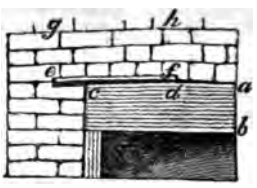
A. Plan.
B. Section.
C. View.

d. Plate-base.
e. Sides of the socket.
f. Mortise for the insertion of the timber.

1283. To put for the support of the front and back walls of the dwelling-house, fir breast-summers scantling, 15 ins. by 13 ins., the breast-summers over the gateway being cut away 3 ins. to the form of an arch, to put under the front of the gateway two fir story-posts, 9 ins. by 13 ins.: to put under the back of the gateway two fir wrought story-posts 6 ins. by 13 ins., and two oak wrought and shaped corbeilles 13 ins. by 9 ins., and 2 ft. 6 ins. long; to put at the ends of the shop-front two fir story-posts 4 ins. by 12 ins. To put by the front shop doorway, a fir story-post 9 ins. by 3 ins.

(See §§ 325—27, and 558—69.)

1284. To boat-bridge the breast-summers with three pieces of wrought-iron 1½ in. by ½ in., and 3 ft. long at each end of each breast-summer. (See § 567.) See also note †.



a—b. Breast-summer.
c—d. Part of ditto slanted off.
e—f. Three bars of wrought-iron, laid upon the slanted part of the timber, and resting also upon the brick-pier.
g—h. Part of the brick-work, which throughout the whole height of the work is to be laid to the same slope as the timber.

To put over the window and the door on the South-side of the shop, a fir wrought breast-summer 12 ins. by 12 ins.

To put to each of the story-posts on the ground-floor, a cast-iron socket-base of metal ⅜ in. thick, and 10 ins. high.

Cast-iron columns.

1285. To provide and fix the following columns of cast-iron,

Three under the shop-breast-summer, each 4½ ins. diameter at bottom, and 4 ins. diameter at top.

One column 4 ins. square for the ssupport of the breast-summer, inserted in the brick-work of the counting-house-chimney.

And one column 3½ ins. square for the support of the back front above the scullery.

To put to the iron columns, bases and capitals, as shown by the drawings.

One-pair floors.

1286. To construct the one-pair flooring with five fir wrought girders scantling 12 ins. by 6 ins., and 18 ft. 6 ins. long, with fir wrought joists 5 ins. by 2½ ins. corked thereon, and trimmers and trimming-joists 5 ins. by 3 ins.; two fir wrought girders over the

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* The author first made use of cast-iron socket-bases for timber posts about the year 1825, and as he believes, was the first who used them.

† The author has invented the term to "Boat-bridge" for this device, in order to save the use of many words: a trial of two years has proved the efficacy of the method, which was only suggested when § 567 was written.

gateway 10 ins. by 9 ins., and 13 ft. 9 ins. long, with fir joists 7 ins. by 2 ins. corked thereon, and trimmers and trimming-joists 7 ins. by 2 ins.; to lay the whole of the one-pair story, with inch-wrought yellow clean deal boards, clear of sap-wood, and grooved and tongued to the part over the shop, with wrought-iron 1¼ in. by ⅛ in.

Loft-floor.

1287. To construct the loft-floor, with joists 5 ins. by 2 ins.; and trimmers and trimming-joists 5 ins. by 2½ ins., and to lay the same with inch-yellow deal, clear of sap-wood.

Floor to the water-closet, &c.

1288. To lay to the water-closet, and to the lobby thereof, inch clean batten floors, on sufficient furrings or bearers.

Two-pair and attic floors.

1289. To construct the floorings of the two-pair story and of the attic story, with joists 12 ins. by 2¼ ins., and trimmers and trimming-joists 12 ins. by 2¾ ins.; and to lay the whole of the two stories with inch yellow deal half boards, listed clear from sap-wood.

Wall-plates and templets.

1290. To put to all the floors above the ground-story, the requisite wall-plates of fir scantling 5 ins. by 4 ins., continued all round the walls at the one-pair, two-pair and three-pair stories, except where the flues occur; and to put under the ends of the girders and other principal timbers, the requisite templets each of fir 2 ft. 6 ins. long, and scantling 6 ins. by 4½ ins.

Roofs over the low buildings.

1291. To construct the roof over the Western part of the shop, with wall-plate 5 ins. by 4 ins., one wrought gutter-plate 12 ins. by 8 ins., one wrought gutter-plate 12 ins. by 3 ins., wrought blocks framed between the two gutter-plates, wrought joists 9 ins. by 2 ins. laid to a current, wrought trimming-joists against the party-wall 9 ins. by 2 ins. (the brickwork being corbeilled out beneath the same), inch yellow-deal boarding for lead clear of sap-wood, and with rolls for the lead.

1292. To construct and fit up the flat over the loft, with wall-plate 4 ins. by 4 ins., fir joists 8 ins. by 2 ins. laid to a current, trimming-joists against the West wall 8 ins. by 2 ins. (supported upon brick-work corbeilled out), gutter-plate 8 ins. by 3 ins., with framed bearers and inch deal boarding for lead, with rolls as described to the flat last mentioned; and to put along the Northern side of the same flat, a strong guard-rail with sufficient standards.

Inclosures, &c., made falsely as curb roofs.

1293. To inclose the sides of the scullery, the water-closet and the lobby thereto adjoining, with curb-rafters 4½ ins. by 2 ins. curb-plate and bottom plate 4½ ins. by 3½ ins., angle-posts 4½ ins. by 4½ ins., window-posts 4½ ins. by 3 ins., braces 4 ins. by 3 ins., and 2 tiers of inter-ties 2 ins. by 1 in.; and to board over the whole of the outsides of the same inclosure with ¾-in. yellow deal.

1294. (This is an instance of a technical evasion of the Building-act, which most District-surveyors permit: but it should never be adopted, except where from difficulties of site, or from contracted dimensions, brick walls cannot be adopted: sometimes it happens that a water-

closet has to be placed in a nook only three or four feet wide, in which case 3 feet of the space may be occupied by two 18-in. walls, which would be requisite to a building of the first rate, and thus leave little or no free space for use: the Building-act allowing of no relaxation in the thickness of walls, that useful Act is thus directly defeated by the almost consequently necessary use of combustible materials, where thin walls of brickwork might otherwise be used. (See § 345.)

Roofs to water-closet and scullery.

1295. To put over the scullery, a roof with fir joists 5 ins. by 2 ins., laid to a proper current; to put over the water-closet and the lobby thereof, a roof with joists 3½ ins. by 2 ins., and to lay both the same roofs with inch yellow deal clear of sap-wood, with rolls for lead.

Minor roofs over the gateway, &c.

1296. To construct the lower roofing over the three-pair story according to the drawings, with wall-plates 4 ins. by 4 ins., diagonal ties and dragon-pieces 4 ins. by 2½ ins., rafters 4 ins. by 2 ins., frames to the sky-lights 5 ins. by 3 ins., ridges 8 ins. by 1 in., valley-pieces 2½ ins. by 6 in., braces to the rafters below the curb-plate 4 ins. by 2½ ins., and slate-battens 2½ ins. by 1 in. To put over the stair-case, a 2-in. yellow deal sky-light, with inch-deal beaded linings, and all other requisite fittings and appertenances complete.

Upper or principal roof.

1297. To construct the upper principal roof, with wall-plates 5 ins. by 4 ins., rafters to the small lean-to roof 3 ins. by 2 ins., other rafters and curb-rafters 5 ins. by 2 ins; two braces to the curb-rafters 4 ins. by 3 ins., rounded ridges and hips 8 ins. by 1 in., valleys 2½ ins. by 8 ins., four angle-ties each 4 ft. long, four dragon-pieces 4 ins. by 2½ ins., slate-battens 2½ ins. by 1 in. four binders each running in one piece from East to West scantling 10 ins. by 3 ins., and ceiling-joists spiked each in one length below the binders 2½ ins. by 2 ins., and fixed with proper fillets at the ends thereof.

(See §§ 411, 430—448, 520—550, and 1047.)

Dormer.

1298. To put in the South quartered-partition at the head of the principal staircase, an upright 1½ in. bead-butt, and square two-panel dormer-door, with 1¼ in. rebated and beaded linings, and hung with strong hinges and bolt; and to form the heads of the two dormer-windows, with frame-work and fittings complete.

Gutters, &c.

1299. To lay to the several roofs inch yellow deal gutter-boards, on strong fir-bearers, with current 1½ in. to every 10 ft., 2½ in. drips in the situations shown by the plans, and cess-pools to the heads of the rain-water-pipes: to put to the gutters and valleys the requisite ¾-in. yellow deal lear-boards 10 ins. wide. (See §§ 520—3.)

Quartered partitions.

1300. To construct the quartered-partitions between the back rooms and front rooms, with heads 6 ins. by 5 ins., ties above the doorways 4 ins. by 5 ins., queens above the ties 6 ins. by 5 ins., four posts to each story 3½ ins. by 5 ins., upper and lower braces or struts 3½ ins. by 5 ins., quarters 5 ins. by 2 ins., and inter-ties not more than 2 ft. 6 ins. apart 2 ins. by 1 in.

[redacted]

...PTER III.

1301. To construct the quartered-partitions on the South side of the principal staircase with bottom-sill, and heads 6 ins. by 5 ins., kings 4 ins. by 5 ins., struts 4 ins. by 3 ins., quarters 5 ins. by 2 ins. not more than 13½ ins. apart, and inter-ties not more than 2 ft. apart scantling 5 ins. by 1 in.

1302. To construct the quartered-partitions on the North side of the principal staircase, with top and bottom plates 4 ins. by 3 ins., ties above the doorways 4 ins. by 4 ins., queens above the ties 4 ins. by 5 ins., struts or braces above and below the ties 3½ ins. by 3 ins., door-posts 4 ins. by 3 ins., quarters 4 ins. by 2 ins., and inter-ties not more than 2 ft. 6 ins. apart, scantling 2 ins. by 1 in.

1303. To construct the partition between the stable and the chaise-house, with oak bottom plate 4¼ ins. by 3½ ins., fir upper plate 4¼ ins. by 4 ins., king-post 4¼ ins. by 5 ins., struts 4¼ ins. by 3 ins., quarters 4¼ ins. by 2 ins., and inter-ties 4¼ ins. by 1 in.

1304. To provide and fix the other requisite quartered-partitions with top and bottom plates and posts and braces 4 ins. by 3 ins., quarters 4 ins. by 2 ins., and inter-ties not more than 2 ft. 6 ins. apart 2 ins. by 1 in. (See §§ 544—50, and 1051—2.)

...d deal ...ons.

1305. To fill in the arched opening in the wall on the South side of the gateway, with 2-in. deal partitioning framed bead-flush on both sides.

To divide off the rooms from the lesser staircase, and to divide off the other parts of the premises as shown by the drawings, by 2-in. deal square-framed partitions with neat door-stops and with ¾-in. deal panels neither glued, nor more than 10 ins. wide. The partitioning of the counting-house is to have the upper part thereof formed with ovolo sashes therein.

...ng, &c.

1306. To form out properly with strong yellow deal ribbed cradling for the plasterer, the ceiling of the best room on the one-pair story, and the ceiling of the lobby to the water-closet.

..., &c.

1307. To put to the side-entrance under the gateway a 2-in. four-panel moulded and bead-flush door, hung with a pair of 4-in. butt-hinges a 10-in. best draw-back iron rimmed lock with key and strong plain brass furniture, and two 10-in. barrel-bolts, in a fir proper door-case 4 ins. by 5 ins. with a transom 4 ins. by 3 ins.; and to fit up the front doorway on the South side of the gateway in all respects the same as the doorway last described except that the back of the door is to be bead-butt; and to put round the outside of the same doorway a deal moulded architrave according to the drawings.

1308. To fit up the principal entrance of the shop with 2-in. folding-doors as shown by the drawings, framed in three leaves, hung with hinges lock and six bolts of the same description as those last described for the other doors.

1309. To fit up the side doorway of the shop, next the yard, with a pair of 2-in. folding sashed-doors with 1¼-in. bead-flush

and square panels, 1¼-in. bead-flush and square shutters with corner shoes dogs and sockets and strong screw fastenings all of wrought-iron, and hung with lock hinges and four bolts the same as to the front doors, in fir proper door-case 5 ins. by 6 ins. with transom 5 ins. by 3 ins.

1310. To put to the stable and to the loft, inch deal ploughed cross-tongued beaded and strongly ledged doors, hung with strong cross-garnet hinges in fir door-cases 5 ins. by 5 ins.; to put to the loft doorway two 10-in. rod-bolts and a 2-in. oak rounded threshold 12 ins. wide; and to put to the stable doorway a 9-in. copper-warded stock-lock a Norfolk thumb-latch and a transom 5 ins. by 3 ins. with wrought-iron bars 1 in. square and not more than 4 ins. apart above the same.

1311. To put to the best front room on the one-pair story, a 2½-in. four-panel door moulded on both sides, and hung with a pair of 4-in. butt-hinges and a best strong mortise-lock with plain strong brass furniture.

1312. To put to the best front chamber on the two-pair story, a 2-in. four-panel moulded and square-framed door hung with hinges and lock the same as to the door last described.

1313. To fit up all the doorways of the remainder of the dwelling-house and offices, with 2-in. four-panel deal square-framed doors with ¾-in. deal panels hung with 3-in. wrought butt-hinges and with best 7-in. iron rimmed locks with keys and the best plain brass furniture complete. The upper panels of the door to the smaller kitchen and of the chamber over the same are to be left out in order that ground glass may be put thereinto instead of deal; and the door of the counting-house is to be sashed.

Door-linings, &c.

1314. To put to all the doorways in the walls and quartered-partitions, 1¼-in. deal single-rebated linings; to put to all the doorways in the walls and quartered-partitions of the one-pair and two-pair stories (except next the inside of the scullery) inch deal framed and beaded grounds; and to put round on both sides of the doorways of every description throughout the house (except to the closets adjoining to the minor staircase) mouldings to form architraves according to the drawings.

Gates, &c.

1315. To construct the front gates according to the drawings, moulded out of the solid, with 3-in. deal styles and rails, 2-in. deal muntins, ¾-in. deal panels, inch deal braces, and large groved and moulded capping with neat wrought-iron spike-heads on the top thereof, and to hang the pair of gates with hinges and fastenings value £6, exclusive of the expense of fixing.

1316. To case the front breast-summer and the story-posts of the gateway and side doorway adjoining thereto, all over with inch yellow deal rebated and beaded; and to put over the gateway and the side-door adjoining thereto a moulded fascia as shown by the drawings.

CHAPTER III.

1317. To put to the chaise-house, a pair of inch deal strongly ledged ploughed cross-tongued and beaded gates, hung with hinges and fastenings, value 30*s.* exclusive of the expense of fixing.

1318. To put to the front of the stable and chaise-house, a wrought and rebated door-head of fir 9 ins. by 6 ins. and two wrought and rebated posts 9 ins. by 4 ins. with cast-iron socket-bases of metal $\frac{3}{8}$-in. thick and forming a cube 9 ins. by 6 ins. and 9 ins. high. (See § 1282.)

Closets and pantry.

1319. To construct the closets according to the drawings, with 2-in. deal square-framed inclosures with $\frac{3}{4}$-in. deal panels not more than 10 ins. wide (except where the drawings show the inclosures to be of quartering), $1\frac{1}{4}$-in. deal four-panel square-framed closet doors with $\frac{3}{4}$-in. deal panels, hung with 3-in. butt-hinges and strong 5-in. iron rimmed locks with strong brass furniture.

Shelves.

1320. To put in the pantry and in each of the closets, three tiers of inch deal shelves of the several widths shown by the plans, the lower shelves being in some instances of extra width as thereby shown, and the whole being securely fixed upon proper strong bearers; and to put over each of the two kitchen-chimneys, a shelf of $1\frac{1}{4}$-in. deal 8 ins. wide fixed upon strong cut brackets.

Skirtings.

1321. To put round the best front-room on the one-pair story, moulded skirting 12 ins. high according to the drawings.

To put round the best front-room on the two-pair story, inch plain moulded skirting 9 ins. high.

To fit up every other part of the dwelling-house (the shop and the basement-story thereof excepted) with inch square skirting 8 ins. high.

Skirting grounds, &c.

1322. The whole of the skirtings are to be fixed with ploughed grounds and the requisite backings.

Angle-staves.

1323. To put to all the projecting angles of the chimney-breasts and other plastered work, proper angle-staves of $1\frac{1}{4}$-in. deal, rebated and beaded where the same are not intended to be covered by paper-hangings.

Balconet.

1324. To provide and fix before the Venetian window, a balconet according to the drawings, with cast-iron fret-work front and wrought-iron horizontal rails and bottom.

French casements, &c. &c.

1325. To fit up the Venetian window of the best room on the one-pair story, with fir proper frame 5 ins. by 4 ins. with muntins English oak sunk sill and $2\frac{1}{2}$-in. lamb's tongue sashes and French casements, hung with 4-in. brass butt-hinges, and with fastenings value 7*s.*

1326. To put to the window of the principal kitchen and to the window of the scullery, 2-in. folding bead-flush and square-framed sashed doors, hung in fir proper door-cases 5 ins. by 4 ins. with oak sills $4\frac{1}{2}$ ins. by 4 ins., and with $1\frac{1}{4}$-in. bead-flush and square-framed shutters with wrought-iron dogs sockets corner-

shoes shutter-lifts and thumb-screws; and a transom and an 1½-in. ovolo sash to be placed over the sashed-doors of the kitchen.

Fan-lights, &c.

1327. To provide six similar sashes or fan-lights of cast-iron according to the drawings, and to fix the same in and over the folding-doors of the shop-front.

To put over all the other external doorways 1½-in. deal fan-lights according to the drawings.

Other windows.

1328. To fit up all the other windows of every kind throughout the building with 1½-in. ovolo yellow deal sashes double-hung with the best large patent lines, iron weights, iron axle-pulleys, and patent spring fastenings, in deal cased frames with English oak sunk sills. The upper sash of the pantry is to be filled in with strong copper fly-wire, and the sills of the windows to the water-closet and to the lobby thereof are to project 3 ins. and to be throated.

Shop-front.

1329. To construct and fit up the shop-front according to the drawings with inch Honduras mahogany fascia, two cast-iron pateras to pattern, a pair of carved trusses, moulded cornice with enrichments of cast-iron, 1-in. deal moulded pilasters with moulded capitals, 1½-in. deal pedestals, 1½-in. plinths and moulded imposts, 1-in. deal linings to the pilasters story-posts and breast-summer, turned oak balusters, 2-in. deal stall-boards, 2½-in. deal ornamental sashes, 2-in. deal square-framed one-panel backs behind the balusters and under the stall-boards and all other requisite fittings bearers furrings linings dressings and appertenances complete.

1330. To put to the side-windows and to the three leaves of the door of the shop-front 1¼-in. deal moulded and bead-butt shutters according to the drawings, with strong wrought-iron corner-shoes dogs and plates sunk shutter-lifts and strong wrought-iron bars with pins staples dogs and all proper fittings and appertenances.

Other window-fittings.

1331. To fit up all the remainder of the windows throughout the dwelling-house and offices with 1¼-in. deal tongued linings, finished so as to form double-quirked beads to the stucco.

Area-gratings.

1332. To provide and fix over each area, a cast-iron grating with bars 1½ in. by ¾ in. not more than 1½ in. apart, frames 1½ in. by 1 in. and with strong flanges let into the paving and brick-work.

1333. The frames of flat area-gratings are best made of cast-iron about 3 ins. deep and rebated so as to extend all round under the paving.

Window-guards.

1334. To put to the lower two windows adjoining to the principal staircase and to the window of the counting-house, guards of wrought-iron with bars 1 in. square not more than 4 ins. apart, and with frame-work of iron of the same substance securely fixed to the brickwork.

Staircase.

1335. To construct the principal staircase according to the

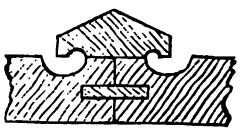
drawings, with 1¼-in. best clean deal risers steps and landings with moulded returned nosings, 1¼-in. beaded cut and mitred string-boards, 1¼-in. wall-strings, strong bracketed carriages, best large moulded Spanish mahogany hand-rail, strong square bar dove-tailed balusters (each tenth baluster being of wrought-iron), turned and framed newels, and all requisite inch deal apron-linings and all proper blockings and other fittings complete. (For stone stairs see Index.)

1336. To construct the minor staircase with 1¼-in. deal treads landings and risers housed into 2-in. string-boards and wall-strings, and deal moulded hand-rail, but in all other respects as described for the principal staircase.

1337. To construct the two flights of basement-stairs, with 1½-in. rough oak treads housed into 2-in. rough oak strings, and to put at the sides of the stairs strong deal rounded guard-rails with chamfered newels and diagonal braces.

Cistern, &c.

1338. To provide and fix a wrought and dove-tailed 2-in. deal cistern-case, —— ft. —— ins. long, —— ft. —— ins. wide, —— ft. —— ins. deep, internal dimensions; and to put thereto all requisite bearers and other fittings, and also a ¾-in. deal cover strongly ledged and with saddle-backed fillets and four water-channels to each joint.



Water-closet and privies.

1339. To fit up the water-closet and the two privies, with inch clean deal seats risers and clamped flaps and frames; to provide all requisite bearers and other fittings; to attend upon the plumbers while fixing the pipes and apparatus; and to cut all requisite pipe-holes.

1340. To provide and fix very neat inch deal casings for the pipes of the water-closet, with rebated and beaded grounds, butt-hinges, and brass buttons.

Dresser, &c.

1341. To put in the lesser kitchen, a dresser with two drawers, three sunk shelves, standards, pot-board and bearers, together in value £4; and to put in the scullery an 1½-in. deal clamped dresser-top, hung with strong hinges rule-joint and moveable bracket-bearers.

Stable fittings.

1342. To fit up the stable, with a large strong wrought-iron hay-rack, and 1½-inch deal manger with oak grooved and rounded rail 4 ins. by 3 ins. and fixed on strong brackets; to form in one angle of the stable a step-ladder to ascend to the loft; and to put in the stable-paving a cast-iron strong trapped grating 12 ins. square.

Dust-bin.

1343. To provide and fix in such situation as shall be directed, a dust-bin with inch yellow deal sliding trap-door, and top with hinges timber-work and all proper appertenances complete.

Ladders.

1344. To provide a strong step-ladder for ascending from the upper landing of the principal staircase to the side dormer, and to provide a strong oak step-ladder for ascending from thence to the principal roof; and to provide a similar oak step-ladder for ascending from the leaded flat over the shop to the leaded flat over the loft, with a strong guard-bar and standards at the side thereof.

25 cubic feet of fir extra.

(See § 1071.)

Jobbing-work.

(See § 1070.)

PLASTERER.

L. P. F. S. and W.

1345. To lath plaster float set and whiten ceilings and strings to every part of the intended dwelling-house except to the basement-story and to the shop thereof.

Cornice, &c. &c.

1346. To run and execute round the drawing-room and round the principal staircase, cornices according to the drawings, and to fix thereto the enrichments properly modelled.

Stucco.

1347. To execute in the very best floated and troweled stucco fit for painting, every part of the sides of all the rooms staircases closets and every other part of the interior of the dwelling-house and counting-house (except of the basement-story and shop).

The whole of the quarters and furrings are to be lathed.

Beads quirks and sundries.

1348. To run and execute all requisite beads quirks and arrises; to perform such dubbing out, and to make out and form such additional thicknesses to the plastering as may be found requisite; and to counter-lath all such parts of the work as may so require, in order to afford a proper key to the work.

CHAPTER IV.

A SPECIFICATION *for erecting and completely finishing fit for occupation a new* PUBLIC-HOUSE *of the* THIRD-RATE OR CLASS *of building, at the corners of street and according to the drawings signed with and forming part of the Contract for the performance of the work, and under the direction of the Surveyor appointed to superintend the same.*

(*Here to follow the list of Working-drawings.*)

BRICKLAYER.

Notice, &c. to District-surveyor, &c.

1349. To give to the District-surveyor, to the Surveyor of Pavements, Surveyor or Commissioners of Sewers, and to all other public officers, the requisite notices, and to pay to the whole of them their proper fees and official charges. (See §§ 987 and 1091.)

CHAPTER IV.

Digging, &c.

1350. To perform all requisite digging of every kind for the foundations drains and other works; to fill in and make good the ground to all the foundations; to remove and cart away all rubbish superfluous ground and useless matters of every kind arising from the performance of the various works, and finally to leave the whole of the house and premises clear therefrom: the ground is to be wholly taken out to the depth of 9 ins. beneath the timbers of the floors of the kitchen and back part of the parlour. (See §§ 988, 989, 1229.)

1351. To bale out draw off or pump away and remove all water and soil which may come into the foundations from springs, currents, drains, cess-pools, rain, or otherwise; and to make good all damage from accident or other cause which may occur during the laying of the foundations as well to the works of the intended new building as also to the neighbouring premises therewith connected.

Repairs and alterations to old brick-work.

1352. To repair thoroughly with the requisite new bricks and make good the old South wall of the basement-story, and to rake out the mortar joints therefrom and point the whole of the same wall with stone-lime blue coal-ash mortar.

1353. To repair thoroughly the brick-work of the kitchen-building, to cut out for and make good to the two windows intended to be inserted therein, and to repair and make good the kitchen-chimney.

Repairs to adjoining brick-work.

1354. To repair in a workmanlike manner all damage which may be occasioned to any adjoining buildings by reason of the building and works of the intended new house.

General brick-work.

1355. To execute all brickwork requisite in order to carry into effect the buildings according to the drawings, and to render the whole of the house and premises in every respect complete. (See §§ 990—1.)

Rough arches.

1356. To turn rough arches where requisite; those of the back-front are to be tuck-pointed. (See Index.)

Gauged arches.

1357. To put to seven of the openings of the West-front gauged arches according to the drawings, cut in a close and accurate manner, and properly set. (See § 358. 570—594.)

Chimneys.

1358. To properly turn parget and core all the flues; to put to each fire-place a 4-in. brick trimmer, 18 ins. longer than the chimney-opening; to carry up the chimney-shafts as shewn by the drawings, and to put over each flue a second-sized chimney-pot, set in tiles and Parker's cement. (See § 996.)

Bedding, &c.

1359. To bed in mortar all the plates, lintels, bond-timber, wood-bricks, stone-work, and all other things in or about the buildings which may so require; and to bed and point with lime and hair mortar all the window-frames and door-frames.

Piers under kitchen-floor, &c.

1360. To put beneath the sleepers of the kitchen-floor, eight brick piers 12 ins. high and 9 ins. square.

Brick-nogging to the Privies.

1361. To brick-nog the partition between the two privies.

Pavement of the basement.

1362. To repair thoroughly the old pavement of the basement story, using for that purpose such of the old bricks to be taken down from the present house as may be requisite for that purpose.

Drains.

1363. To construct a barrel-drain 18 ins. bore as shewn by the plan, and to continue the same into the public sewer; the drain is to be stuccoed on the inside over the lower half thereof, with pure quick Parker's cement ¾ in. in thickness.

(See § 1104.)

1364. To put to each of the privies and rain-water pipes, a brick hopper, 18 ins. diameter, and to stucco over the inside of the same ¾ in. thick, with pure quick Parker's cement.

Facings.

1365. To face externally with the best second malm-stocks, matched of an uniform colour, the whole of the brickwork of the North-front of the house, and all that part of the West-front thereof which lies over the shop-front; all the other brickwork is to be faced externally with hard picked stock-bricks. (See §§ 358—60, and 867.)

1366. The North and West parapets are to have projecting fascias of brickwork 18 ins. high, according to the drawings.

Extra brickwork.

(See § 1007.)

Bricks

1367. All the bricks, except the malm facings, are to be new approved hard-burnt square grey stock-bricks, without any admixture of soft bricks, place-bricks, or other inferior bricks.

Mortar

1368. The whole of the mortar is to be compounded in the proportion of one third by measure of the best Dorking stone-lime, and two thirds by measure of sharp Thames sand properly beaten together.

Grouting, &c

1369. The whole of the brickwork is to be flushed in at every course thereof with mortar, and is to be thoroughly grouted with liquid mortar at every alternate course, great care being taken in order that the outer faces of the work shall not be stained.

Mode of doing the work

1370. No four courses of brickwork are to rise more than one inch, exclusive of the height of the bricks: all the external walls above ground are to be scrupulously carried up in Flemish bond, throughout their whole thickness, with all the heading-bricks carried through both withinside and withoutside, in order to prevent excuse for the bad union of two different kinds of bond; all the other brickwork is to be laid in manner of English bond; all the joints of the work are to be neatly struck, and those on the outside thereof are to be drawn. (See §§ 353—365, and 1010.)

Reparation of accidents, &c

1371. All the walls are to be built level, except where otherwise directed; and should any damage occur to the work by accident, settlement or otherwise, during the time of the building, or during twelve calendar months thence after, the Contractor is

to make the same good as shall be by the Surveyor directed. (See § 1111.)

Tile cresting, &c.

1372. The whole of the walls which are not intended to have stone coping thereon, are to be finished with double plain-tile cresting and brick-on-edge, both set in and jointed with fresh quick Parker's cement and Thames sand, mixed together in equal measures.

Jobbing-work.

(See § 1011.)

MASON (see §§ 265—295.)

3-in. Yorkshire stone in foundation.

1373. To bed all along beneath the foundation of the party-wall, a course of 3-in. Yorkshire stone 2 ft. 8 ins. wide; and to bed all along beneath the basement foundations of the North and West external walls, a course of similar paving 2 ft. wide.

8 pieces of granite under iron-girders.

1374. To bed in the brick-work of the basement-story, eight pieces of granite street-curb, each 3 ft. long, to receive the ends of the cast-iron girders of the ground-flooring.

Granite base to shop-fronts.

1375. To provide and bed all along the two shop-fronts, and the circular corner connecting the same, a continuous base formed of new parallel square Aberdeen granite curb, 12 ins. by 8 ins., dressed fair all round where in sight, and at the joints thereof, and plugged with lead: the granite base is to be continued so as to form a step to the side entrance doorway.

Six window-architraves.

1376. To provide and fix the six window-architraves, according to the drawings, of the best Portland stone, in as few pieces as possible, plugged and cramped with copper, and fixed with sufficient bond-stones.

String-course.

1377. To provide and fix beneath the windows of the two-pair story, a weathered and throated string-course of the best Portland stone 6 ins. high, 8 ins. bed to the part forming the window-sills, and 6 ins. bed to the other parts.

Window-sills.

1378. To put to all the remainder of the windows, Yorkshire stone weathered and throated solid quarry sills, 8½ ins. by 4½ ins.

Coping.

1379. To cover the parapets of the North and West fronts of the house, with the best Portland stone coping 4 ins. thick, moulded in front, chased out to receive the flashing, and with the joints plugged with lead.

Back chimney-corbeille of 4 in. Yorkshire stone landing.

1380. To put for the support of the back chimney-stack over the breast-summer, a corbeille of 4 in. Yorkshire stone landing the entire size of the chimney-stack. (See § 1267, and see also § 45 of the Building-act.)

Chimney-pieces, &c.

1381. To put to all the fire-places, 2½ in. Yorkshire stone hearths, 1½ in. Portland stone slabs 18 ins. wide, and 1¼ in. Portland stone jambs mantles and shelves each 6 ins. wide.

Sink. 1382. To put in the scullery, a sink of Yorkshire stone 7[illegible] thick, as shown by the plan, and cut out for the waste-pipe and grating.

Paving. 1383. To pave the yard and the scullery with new Yorkshire stone, not less than 2½ ins. thick, worked quite fair on the edges through the whole thickness thereof, and laid in regular courses.

To put in the pavings of the yard, a five-hole sink-stone.

Public paving 1384. To make good all the public paving (damaged or affected by the execution of the works) to the satisfaction of the Commissioners of paving, or defray to them the expense thereof as they may require.

SLATER (See §§ 542—3).

1385. To slate the roof of the principal building with the best countess slates fixed with copper nails, and with cut heading-courses with bond as to the other parts of the work.

To repair in a satisfactory manner all damage which may occur to the work, and finally leave the same perfect at the rendering up of the whole building as complete. (For amplification see §§ 542—3 and Index.)

CARPENTER and JOINER. (See §§ 337—40.)

Materials, &c 1386. To provide materials for and frame and fix all carpenter's work and joiner's work of every kind (complete with ironmongery of the best quality) which may be requisite for carrying into effect and for finishing in every respect the house, buildings, and premises according to the design, and in order to render the same complete and perfect.

Timber and deals. 1387. All the oak timber is to be of English growth; all the other timber is to be either Dantzic Riga or Memel yellow fir: all the floors and joiner's works and other wood-work are to be of the best yellow Christiana deal, except where herein otherwise directed: all the timbers and deal are to be cut out square, and perfectly free from the least sap-wood in any part thereof, and from shakes, large knots, and all other defects: none of the joists, rafters, ceiling-joists or quarters are to be respectively more than 12 ins. apart.

Hoard. 1388. To erect and maintain sufficient hoarding for inclosing the ground while the building is being carried on, and to remove the same when so directed.

Bond-timber. 1389. To put all round in the new brick-work of the ground story, three complete tiers of fir bond-timber 4 ins. by 2½ ins.; and to put all round in the brick-work of each of the other stories two tiers of similar bond-timber.

The bond-timber is to be properly lapped at least 6 ins. at all the joints therein, and is to be properly spiked together. (See § 1038.)

[redacted]

APTER IV.

-bricks. 1390. To put in the brick-work such wood-bricks as may be requisite for fixing the various finishings.

ring. 1391. To provide, fix, ease, and finally remove when so directed, centering sufficient for all the openings, gauged and rough arches, and trimmers.

ries. 1392. To fix all the smith's work so far as connected with the carpenter's work.

1393. To provide and fix all requisite templets, lintels, blocks, stops, linings, casings, fillets, tilting-fillets, beads, grounds, furrings, cappings, and other usual and appropriate fittings and finishings proper and necessary for the carpenter's work and joiner's work; and to perform to the wood-work all needful grooving, beading, rebating, tonguing, framing, mitring, housing, and other proper work and labour.

ing. 1394. To shore up the ground all round the new building in a secure manner; and to provide, fix, maintain, and finally remove all shoring which may be requisite to the adjoining buildings, with the exception of the shoring requisite to the next house in consequence of the building of the new party-wall, the expense of which shoring is to fall upon the proprietor of the said next house. (See § 42 of the Building-act.)

r of ground

	ins.	ins.
1395. Joists (laid on the iron girders)	6 by	2½
Trimmers and trimming-joists	6 —	3
2 sleepers of oak to the kitchen	5 —	3
2 cross plates under the parlour	4 —	2½
1¼-in. yellow deal folding floor of half boards, listed free from sap-wood, and rebated and fitted on the under side thereof.		
2 steps to be formed in the passage leading to the yard, and the back outer door to have an 1¼-in. oak tread.		

1396. To cover over the cellar-entrance with 1¼-in. oak strongly ledged with oak in a rebated oak frame 4 ins. by 5 ins. with wrought-iron dogs and all other proper ironmongery.

er floors.

	ins.	ins.
1397. Wall-plates	4 by	4
Joists	10 —	2
Trimmers and trimming-joists	10 —	2½
Each floor with one tier of herring-bone struts down the middle thereof.		
Inch white deal folding-floor of half-boards listed, free from sap-wood.		

: over ground
y, &c.

1398. Wall-plate	4 by	2½
Joists	4 —	2
Inch yellow deal boarding for lead upon proper furrings.		
Breast-summer to receive the ends of the joists and the back front	12 —	14

[redacted]

PA[redacted]

		ins.
	1 story-post under ditto	9 by [redacted]
	Inch deal tongued and beaded casing to breast-summer.	
	(Add here boat-bridging to the breast-summer. See § 1284.)	
Roof over attic story	1399. Curb-rafters	5 by 2½
	Circular framed plate to the curb rafters at the feet of the circular corner of the roof	5 — 3
	Curb-plate	5 — 4
	Upper rafters	4½ — 2
	Ridge and one hip (rounded for lead)	1 — 6½
	Angle-ties (each 5 ft. long)	4 — 2½
	Binders	9 — 3
	Ceiling-joists (spiked beneath the binders)	2½ — 1½
	Dormer with inch ledged tongued, and beaded trap-door and outer trap-door and fittings complete, and with a step-ladder to lead out therefrom.	
	2-in. skylight 6 ft. long and 5 ft. wide with inch linings and all proper fittings complete.	
	Inch yellow deal gutter next the party-wall 8 ins. wide at the lower end with current 1½-in. to 10 feet, 2½-in. drips, and ¾-in. deal lear-board 8 ins. wide, ¾-in. yellow deal slate-battens 2 ins. wide. (See § 520—3.)	
Breast-summers, shop fronts, &c.	1400. Breast-summers framed and bolted together (see § 1284)	12 by 12
	2 end story-posts (see § 1282)	9 — 4½
	Inch deal tongued and beaded casings to breast-summer story-posts and iron columns.	
	1¼-in. keyed frieze to show 2 ft. wide.	
	Cornice with composition enriched ovolo and bead (or of cast-iron. See index.)	
	1¼-in. plain pilasters with moulded capitals.	
	Framing between the pilasters according to the drawings, with ¾-in. panels with plain mitred margins 3¼ ins. wide, 1½-in. bottom rails 8½ ins. wide, 1½-in. double-faced top-rails 6½ ins. wide with large grooved and molded capping, 1½ in. styles and muntins 6 ins. wide with small capitals mitred round the tops thereof to form pilasters.	
	1¼-in. three-panel bead-flush outside shutters hung with large patent lines, brass axle-pulleys, iron weights, and screw-fastenings complete in proper deal cased-frames.	
	1¼-in. three-panel square framed internal window-backs.	
	2-in. lamb's-tongue sashes hung in frames complete the same as the shutters.	

Windows.

1401. To fit up all the other windows of the premises with deal cased-frames with oak sunk sills and 1½-in. ovolo sashes double hung with iron pulleys and weights, large patent lines, and patent spring fastenings: the three windows of the ground story are to have 1¼-in. bead-flush and square outside shutters hung complete with Redmund's rising and falling hinges and two strong bolts to each window.

CHAPTER IV.

1402. To put to the two dormer-windows 1½-in. pilasters, and entablatures and mouldings and other dressings as shown by the drawings.

Quartered-partitions.

1403. To provide and fix the quartered-partitions as shown by the drawings, with

	Ins.	Ins.
Plates and posts	4	by 3
Quarters	4	— 2
Braces	3	— 3
One tier of inter-ties to each story	3	— 1

(See §§ 544—50 and 1050—52.)

Framed partitions.

1404. To divide off and inclose the rooms passages and other parts of the premises, as shown by the drawings, with 2-in. square framed deal partitions with ¾-in. deal panels; the partitions of the parlour to be framed flush on the inside to receive canvass and paper-hanging; the partition inclosing the "bar" is to have a hatch and an opening formed in the usual manner.

Skirtings.

1405. To skirt the whole of the premises with plain ¾-in. deal 6 ins. high plugged to the walls.

Dwarf wainscotting.

1406. To put round the brick-work of the parlour and round the brick-work of the tap-room 1½-in. square framed wainscotting 4 ft. high with beaded capping and proper backings.

External doors.

1407. To put to the three outer door-ways of the house 2-in. lamb's-tongue sashed-doors hung in fir proper frames 4 ins. by 4 in., the posts thereof let at bottom into the stone steps, and with a socket of 4 lbs. milled-lead to the foot of each post, and with inch tongued and beaded linings rounded each doorway: each door is to have also an inch bead-flush one-panel shutter with wrought-iron dogs and corner-shoes and screw-fastenings complete.

The doors at the corner of the house are to be circular on the plan, to be moulded, and to be hung folding with three pairs of 4-in. butt-hinges and other ironmongery of 20*s*. value in addition thereto.

Each of the other doors is to be hung with a pair of 4-in. butt-hinges, a strong 8-in. iron rimmed lock, and two 9-in. barrel bolts.

The side entrance is to have an 1½-in. circular fanlight with transom complete.

ther doors.

1408. To put to every other part of the premises 1½-in. square framed four-panel doors, hung with 3-in. butt-hinges and 7-in. iron rimmed locks; two of the doors on the one-pair story and two of the doors on the two-pair story are to be sashed in order to enlighten the staircase.

oor and window rings, &c.

1409. To put to the doors and windows, the requisite inch deal, tongued beaded and double-quirked linings, and to put round the doors beaded and mitred stops and ogee moldings.

aircase.

1410. To construct the staircase from the ground-story upwards according to the drawings, with 1¼-in. clean deal treads risers and landings housed into 2-in. string-boards, strong turned and framed newels, deal molded hand-rail, square bar balustres, and all requisite linings and fittings complete.

To construct the staircase from the ground story to the basement story, with 1½-in. rough oak treads and strings framed together, and with a fir rail and a newel 3½ ins. by 3½ ins. The head of the basement stairs is to be inclosed by a framed partition and a door both the same as to the rooms.

Privies.

1411. To fit up the insides of the privies with 1¼-in. clean deal seats and risers on proper bearers, and inch deal clamped flaps and frames, the flaps hung with 2-in. brass butt-hinges.

Closet shelves.

1412. To provide and fix in the closets 50 ft. superficial of inch deal shelves on proper bearers.

Table-top in scullery.

1413. To provide and fix in the scullery an 1¼-in. deal table-top as shown by the plan.

10*l.* other fittings.

1414. To put in the other parts of the premises such other fittings to the value of £10 as may be by the architect or surveyor directed.

Extra fir timber.

(See § 1071.)

Jobbing-work.

(See § 1070.)

SMITH.

4 cast-iron girders.

1415. To provide and fix at the ground-floor four cast-iron girders, each equal in weight to a solid scantling of cast-iron 9 ins. by 2½ ins.

5 cast-iron columns.

1416. To provide and fix five cast-iron columns to support the breast-summers, each 4 ins. diameter at bottom and 3½ ins. diameter at top, and with proper capitals, and also plates at top and bottom each 12 ins. square and 1½ in. thick.

Chimney-bars.

1417. To put to each of the fire-places a wrought-iron chimney-bar 2½ ins. by ½ in. properly corked at the ends thereof.

6 cast-iron cradles.

1418. To put over each of the six stone window-architraves a cast-iron cradle, feathered at the top so as to be of an average scantling of 3 ins. by 1½ in.

Cast-iron is here given as a variety, but wrought-iron soldered up in sheet lead is to be preferred for this purpose. (See § 286.)

224 lbs. wrought-iron ties, &c.

1419. To provide and fix 224 lbs. weight of such ties, bars, bolts, and other wrought-iron work as may be requisite for the building. (See provision for addition or deduction, § 1277.)

PLASTERER.

L. P. S.

1420. To lath with heart of fir laths, and plaster and set the curb-rafters and the whole of the ceilings, strings, and quartered-partitions above the basement story.

CHAPTER IV.

Render and set.

1421. To render and set the whole of the internal brickwork above the basement story throughout the whole premises.

Colouring and whiting.

1422. To whiten the whole of the ceilings and strings, and to colour the whole of the plastered sides of the premises, the plastering of the parlour excepted.

PLUMBER.

6 lb. milled-lead gutter.

1423. To lay the gutter next the party-wall with 6 lb. milled-lead turned up 5 ins. high against the brickwork and 9 ins. wide against the rafters.

6 lb. milled-lead to flat.

1424. To lay the small flat over the ground story of the principal part of the house with 6 lb. milled-lead with a roll down the centre, a gutter sunk 6 ins. deep at one end, and the lead turned up 5 ins. high all round the flat.

5 lb. milled-lead to shop-fronts.

1425. To cover the entablatures of the shop-fronts with 5 lb. milled-lead turned up 4½ ins. high against the brickwork.

4 lb. milled-lead flashings.

1426. To put to the gutters, to the flat, and to the shop-fronts, flashings of 4 lb. milled-lead 5 ins. wide.

4 lb. milled-lead to ridge and hip and to skylight.

1427. To cover the ridge and the hip of the roof with 4 lb. milled-lead 16 ins. wide, properly dressed and secured.

To put to the skylight over the staircase 4 lb. milled-lead flashings 15 ins. wide.

5 lb. milled-lead to dormers.

1428. To cover the heads of the two dormer-windows and the top sides and foot of the dormer-way out from the roof, with 5 lb. milled-lead, turned and dressed 6 ins. at the least over the slating.

5 lb. milled-lead to curb-roof.

1429. To put beneath the bottom of the slating of the curb-rafters a flashing of 5 lb. milled-lead 9 ins. wide burnt into the stone coping.

1430. (By this construction, the principal evils of curb-roofs were avoided: the curb-rafters were made to pitch upon the wall-plate, instead of casting the weight of the roof some way in upon the flooring as is usual, and from which cause many houses are much injured: by this mode the usual narrow and dangerous guttering at the feet of the curb-rafters is altogether omitted.)

Rain-water-pipe.

1431. To put at the South-east angle of the house, a stack of 4-in. cast-iron rain-water-pipe, to lead from the lead gutter at the top of the party-wall down to the gutter of the small leaded flat, and from thence to the drain; and to put from the roof over the kitchen a 3-in. cast-iron rain-water-pipe: the whole of the rain-water-pipes are to be fixed with heads and shoes complete.

Eaves' gutter.

1432. To put to the eaves of the roof above the curb-rafters 4-in. cast-iron guttering, fixed on strong wrought-iron brackets complete; the circular corner of the guttering is to be of copper.

Waste-pipe to sink.

1433. To put to the sink in the scullery a 2-in. strong lead waste-pipe with a brass grating; the end of the pipe is to be carried beyond the funnels of the privies, so as to wash away the soil therefrom, and the pipe is to be bent so as to form a stench-trap.

PAINTER.

1434. To knot, stop, prepare properly, and paint four times with the best oil-colour the whole of the wood-work, iron-work, and other works of the whole premises which usually are painted.

1435. The sashes and the hand-rail of the stair-case are to be finished dark purple brown; all the remainder of the work is to be finished in such plain teints of stone-colour as may be directed.

To paint black the backs of the two blank sashes.

1436. To stain-ceil the sides of the parlour as shall be directed so as to appear as paper-hanging value 8*d*. per yard, the partitions being first lined with strong cartridge-paper.

GLAZIER.

1437. To glaze with good ground glass the four sashed doors next the staircase, and to glaze with good second Newcastle crown glass the whole of the remainder of the sashes and lights of every kind. The whole of the glass is to be properly bedded, bradded, and back-puttied, and is to be cleaned and left perfect at the final rendering up of the premises as complete.

CHAPTER V.

SPECIFICATION *for erecting and completely finishing an HOTEL (or TAVERN or INN, with ASSEMBLY-ROOMS) on a certain plot of ground situate at* *for* *under the directions of the Architect of the said* *, and according to the Working-drawings hereunder enumerated.*

(Insert here a list of the Working-drawings.)

BRICKLAYER.

Notice, &c. to District-surveyor, &c. (if requisite.)

1438. To give to the District-surveyor, (if any,) the requisite notices, and pay to him his proper official fees.

1439. To obtain all requisite licenses from the surveyors of pavements roads and sewers and other public offices, (if any,) and to pay all official dues fees and charges attendant thereon.

Clearing site (if requisite.)

(See § 1228—9.)

Digging and ground-work.

(See §§ 988, 1229, and Index.)

Rubbish.

(See § 989, and Index.)

CHAPTER V.

General brick-work. (See §§ 990—1.)

Under-pinning to adjoining wall (if any.) 1440. To under-pin, in the most careful and secure manner, with sound hard new stock-bricks, set in equal measures of new quick Parker's cement and clean Thames sand, all the adjoining walls surrounding the site of the intended new buildings, the foundations of which will be exposed or endangered by the excavations for the intended new works.

White brick facings (if any.) (See § 1097.)

Yellow brick facings (if any.) (See § 1235.)

Common facings. (See § 1365.)

Rough arches. (See Index.)

White brick arches (if any.) (See § 593.)

Yellow gauged arches (if any.) (See § 1357.)

Vaulting. (See § 468. 508, and Index.)

Dry-areas. (See Index.)

Chimneys. (See 996, and Index.)

Chimney-pots. (See Index.)

Bedding. (See § 1359.)

Brick-nogging. (See § 1247.)

Piers under the wood floors. (See § 1000.)

Cross walls under the stone pavings. (See Index.)

Brick-flat paving. (See § 1246.)

Brick-on-edge paving. (See § 1100.)

Clinker paving to stables. (See Index.)

Tile paving. 1441. To pave the larder, the dairy, and the with 12 in. red *(or white as the case may be)* paving-tiles, bedded in mortar upon full 3 ins. in depth of fine coal ashes *(or dry brick rubbish or lime-core, as the case may be)* and pointed with Parker's cement at all the joints thereof.

(If the tiles are to be laid anglewise, a description accordingly must be given.)

Drain-work, cess-pools, &c. (See §§ 1001—4, and Index.)

Brick-on-edge and tile-cresting. (See § 998.)

Rods extra brick-work. (See § 1007.)

Bricks. (See § 1008.)
(If grey stock bricks cannot be obtained, a description must be given accordingly.)

Mortar. (See § 1009.)

Mode of doing the work. (See §§ 353—365, and 1010.)

Scaffolding. (See Index.)

Jobbing-work. (See § 1011.)

(MASON. See § 265—295.)

Yorkshire stone to foundations (if any). (See § 1115.)

Sills of Portland stone. (See § 1118, and Index.)

Sills of Yorkshire stone. (See § 1014.)

Sills of other stone (as the case may be). 1442. To put to the windows of sills of (stone from Bramley-Fall or Castle Hill or Ketton or Bath or elsewhere as the case may be) scantling ins. by ins. properly sunk weathered tooled all over (or rubbed smooth as the case may be) and throated.

Portland stone copings. 1443. To cover the parapets of with the best Portland stone copings. (See §§ 1012—3 for further description,)

Yorkshire stone copings. 1444. To cover the parapets and walls of with Yorkshire stone copings. (See Index.)

Other stone copings. 1445. To cover with coping of ins. wide, ins. thick in front, ins. thick at the back, tooled all over (or rubbed as the case may be) throated at both edges, and channelled and plugged with lead at all the joints therein.

Yorkshire stone paving. 1446. To pave with the best Yorkshire stone, wrought fairly through the entire thickness thereof, laid in regular courses, and not less than 2½ ins. thick in any part, the whole of the scullery, the margin 4 ft. wide all round the kitchen, and the office-passages, the areas, the office-court, and

1447. To pave the entrance-hall and with the best rubbed Yorkshire stone, laid in regular courses, and not less than 2½ ins. thick in any part thereof.
(For other pavings see Index.)

Granite paving to yard and stables (if any). (See Index.)

Pebble paving (if any). (See Index.)

Other stone pavings. (See Index.)

CHAPTER V.

Chimney-corbelling (if any.) (See Index.)

Door-dressings (if any). (See Index.)

Window-dressings (if any). (See Index.)

Stone cornice. (See Index.)

Blocks. (See Index.)

Balustrading (if any). (See Index.)

Portico (if any.) (See Index.)

Verandah. (See Index.)

Area-curbs (if any). 1448. To put round the front areas (or other areas if any) curbs of Portland stone scantling, 6 ins. by 6 ins. rubbed fair all over except at the bottom thereof, plugged and run with lead at all the joints therein, and with holes cut out to receive the iron palisading and other work.

Steps and landing of Portland stone. 1449. To put to the principal entrance of the building, steps and landing of Portland stone, according to the drawings, with moulded nosings, properly jointed, and rubbed smooth all over.

(If the landing be so large as to require to be composed of several stones, these should have proper joggled joints run with lead.)

Solid Yorkshire stone steps. 1450. To put to the doorways steps of solid quarry Yorkshire stone, scantling 13 ins. by 7 ins. tooled all over properly back-jointed and securely fixed upon brick piers.

3-in. Yorkshire stone steps. 1451. To put to the doorways and to the staircase leading down to the basement-story, steps landings and risers of 3 in. tooled Yorkshire stone, wrought with fair tooled edges, and securely pinned into the brickwork.

Other steps. 1452. To put to steps of stone from Bramley-Fall (or of Craig-leith or of Purbeck or other stone as the case may be) scantling by , properly back-jointed tooled (or rubbed fairly as the case may be) all over, and securely fixed.

Portland stone principal stairs. 1453. (See Index.)

A principal staircase may be made of Craig-leith stone, which, however, though it may wear less, will not appear so handsome.

Except in the best work, moulded soffits to the steps may be dispensed with, and the stone may then be cut plain diagonally at the bottom; but the soffit of a stone staircase may be made very handsome by being wrought in panels, either with plain or enriched mouldings. Wooden staircases ought to receive general reprehension; and although a wainscot staircase (if not burnt) may wear longer than a staircase of stone (unless of very hard stone), that is not a sufficient reason for the use of wood in such a situation, the noise caused by trampling upon which is not among its virtues.

Yorkshire stone back staircase. (See Index.)

Cistern (if any.) (See Index.)

Sinks. (See § 1273.)

Wine-cellar. (See § 1131.)

Cold bath. (See Index.)

Marble chimney-pieces, &c. 1454. (Insert here a list of the value of the several ma chimney-pieces. See § 1126.)

Portland stone chimney-pieces. 1455. To put to the kitchen fire-place, jambs mantle shelf, each of Portland stone, 2½ ins. thick, and 9 ins. wide.

1456. To put to all the other fire-places throughout building, jambs mantles and shelves of 1¼ in. Portland st 6 ins. wide.

Portland stone slabs. 1457. To put to all the fire-places which have not ma slabs, slabs of Portland stone full 1¼ ins. thick, full 18 ins. v and 16 ins. longer than the chimney-opening. (See § 1020.)

Hearths. 1458. To put to all the fire-places throughout the build back hearths of 2½ in. rubbed Yorkshire stone.

Granite bases to heel-posts of stable (if any). (See Index.)

Granite sill to stable-door. (See Index.)

Granite continuous sill under story-posts (if any). (See § 1256.)

SLATER. See §§ 542—3.

Dutchess slating to present buildings. (See Index.)

Countess slating to office-buildings. (See § 1023.)

Bond, &c. (See § 1024, and Index.)

Reparation. (See § 1025.)

CARPENTER and JOINER. (See §§ 337—40.)

New materials. (See § 1029.)

Timber and deals. (See § 1031.)

Sundries. (See § 1032.)

Centering. (See § 1141.)

CHAPTER V.

Sheeting (if any.) (See Index.)

Casing to stone-work. (See Index.)

Bond-timber (See § 1038.) 1459. To put round the buildings the following bond-timber scantling 4 ins. by 2½-ins. lapped at least 6 ins. at all the joints, and securely spiked.

Round the ground-story and one-pair story of the principal building three tiers in each story.

Round the assembly-room five tiers.

Round each story of the stable-buildings one tier.

Round each story above the basement to all the other parts of the buildings two tiers.

Wood-bricks. 1460. To put in the brickwork, all wood-bricks which may be requisite for receiving the ends of the lintels and for fixing such finishings as may so require.

Lintels. (See § 1041.)

	Ins.	Ins.
Ground flooring over the cellars and basement not arched. 1461. Oak wall-plate pitched all over and laid upon a set-off and not in the wall (see Index for observations relative to pitch,) ...	5 by	4
Girders (*if any*)		
Binders (*if any*)		
Joists		
Trimmers and trimming-joists		
1¼-in. yellow deal wrought flooring-boards listed free from sap-wood, rebated and filleted on the underside, edge-nailed and laid with straight joints ...		
Other ground flooring. 1462. Oak sleepers...	5	3
Oak (*or fir as the case may be*) joists	4½	2½
1¼-in. yellow deal wrought flooring-boards listed free from sap-wood, edge-nailed and laid with straight joints		
Floor of the assembly-room. 1463. Wall-plates	6	6
Girders (*if any*)		
Binders (*if any*)		
Trimmers and trimming-joists		
1¼-in. right Dutch Wainscot batten-flooring free from sap-wood, edge-nailed and laid with straight joints		
Floors of the lofts. 1464. Wall-plates	5	4
Girders (*if any*)		
Binder over each stable heel-post, wrought fair and beaded on the edge (or the binders may be cased with inch or ¾-in. deal wrought tongued and headed, and with cornices of wood or of plaster thereon) to form the stable-ceilings into as many panels as stalls	12	4½
Linings of inch yellow deal with moulding all round the stable-walls to range with and answer to the mouldings and fascias of the binders.		
Inch yellow deal beaded linings round the well-holes (if any) in the stable-ceilings.		

1¼-in. yellow deal rebated and filleted flooring-boards listed free from sap-wood and laid folding.

1¼-in. yellow deal wrought grooved cross-tongued and mortise-clamped flaps hung in the well-holes (*if any*) with strong joints and with a strong flush ring to each.

		Ins.	Ins.
Floors to the principal chambers, and to the	1465. Wall-plates	6	4
	Girders (*if any*)		
	Binders (*if any*)		
	Joists		
	Trimmers and trimming-joists		
	1¼-in. yellow deal clean wrought batten flooring listed free from sap-wood, edge-nailed and laid with straight joints		
Floors to the remainder of the buildings.	1466. Wall-plates	5	4
	Girders (*if any*)		
	Binders (*if any*)		
	Joists		
	Trimmers and trimming-joists		
	Inch white deal flooring-boards listed free from sap-wood and laid folding		
Principal roof. (See §§ 430—48.)	1467. Wall-plates	6	6
	No. — Tie-beams		
	No. — King-posts (*if any*)		
	No. — Queen-posts (*if any*)		
	No. — Principals		
	No. — Collar-beams (*if any*)		
	No. — Straining-pieces (*if any*)		
	No. — Struts		
	No. — Angle-ties (each ft. long)		
	No. — Dragon-pieces		
	Pole-plates	5	4
	Purlins		
	Rafters		
	Ridge and hips rounded for lead	8½	1¼
	¾-in. yellow deal slate-battens 2¾-ins. wide		
	Binding-joists		
	Ceiling-joists spiked in one length beneath the binders (See Index for iron-work.)		
Roof over the minor buildings.	1468. Wall-plates	5	4
	No. — Tie-beams		
	No. — Angle-ties (each ft. long)		
	No. — Dragon-pieces		
	Rafters		
	Hips and Ridges rounded for lead	8	1
	¾-in. yellow deal slate-battens 2¾-ins. wide		
Roofs over the stable offices.	1469. Wall-plates	5 by 4	
	No. Tie-beams		
	No. Angle-ties, each ft. long.		
	No. Dragon-pieces		
	Rafters		
	¾-in yellow deal slate-battens 2¾ ins. wide.		

(*Insert the scantlings of trusses and purlins, if any.*)

CHAPTER V.

Dormers. (See Index.)

Gutters. (See Index.)

Fascias and eaves'-boards (if any.) (See Index.)

Moulded skirtings. 1470. To put round the assembly-room, the coffee-room, the dining-room, the ladies'-room, the entrance-hall, the principal lobbies, and moulded skirtings according to the drawings, with rebated plinths of inch yellow deal, ploughed grounds, and all requisite backings, and other proper appertenances.

Torus skirtings. 1471. To put all round the chambers on the one-pair story, and round the inch deal torus skirting 8¼ ins. high, fixed with proper ploughed grounds.

Square skirting. 1472. To fit up all the remainder of the plastered apartments, passages, lobbies and closets throughout the whole of the buildings, with inch-deal square skirting 8 ins. high, plugged to the walls.

Battening. (See Index.) 1473. To batten with inch yellow deal 2¼ ins. wide, the external walls of the entrance-hall, coffee-room, and assembly-room.

Cradling. 1474. To put cradling and bracketing of inch yellow deal, securely fixed to receive the coffered ceilings of the entrance-hall, principal stair-case, assembly-room and coffee-room, the arched and groined ceilings of the passages and lobbies, and the entablatures of the colonnades in the entrance-hall corridor and assembly-room: all the arched cradling is to be in two thicknesses of inch deal.

1475. The modern method of plastering arched-work upon wood, is extremely reprehensible: arches of brick should be adopted upon all possible occasions, thereby rot combustion, and in general cracks in the plastering, will be prevented. It is the author's intention to try the use of cradling of wicker-work, where great lightness will be required, and he proposes also to try cradling of copper wire-work; where great lightness will be required in fire-proof buildings: this kind of cradling will need no laths. (See § 332.)

Windows with French casements (if any.) 1476. (See Index.)

Windows with mahogany sashes (if any.) (See Index.)

Windows with wainscot sashes (if any.) (See Index.)

Windows with 2½ in. deal sashes. (See Index.)

Windows with 2 in. deal sashes. (See Index.)

Windows with 1½ in. deal sashes. (See Index.)

Other windows to stables, &c. (See Index.)

Boxed shutters. (See Index.)

Shutters hung as sashes.	(See Index.)
Outside shutters.	(See Index.)
Window-linings.	(See Index.)
Mahogany doors (if any.)	(See Index.)
Wainscot doors (if any.)	(See Index.)
2½ in. deal external doors.	(See Index.)
2 in. deal internal doors.	(See Index.)
2 in. deal external doors.	(See Index.)
1½ in. deal doors	(See Index.)
Ledged doors.	(See Index.)
Principal entrance gates.	(See Index.)
Coach-house gates.	(See Index.)
Door-cases.	(See Index.)
Door-linings.	(See Index.)
Door-grounds.	(See Index.)
Architraves.	(See Index.)
Mouldings as architraves to other doors and to windows.	(See Index.)
Quartered-partitions.	(See §§ 544—50, 1050—52, and Index.)
2-in. framed deal partitions.	(See Index.)
Deal or wainscot sky-lights (if any).	(See Index.)
Metal sky-lights (if any).	(See Index.)
Wainscot-stairs (if any).	(See Index.)
Deal stairs (if any).	(See Index.)
Closets.	(See Index.)
Hot-bath.	(See Index.)
Water-closets	(See Index.)
Privies.	(See Index.)
Cisterns.	(See Index.)
Sinks.	(See Index.)
Dressers.	(See Index.)

[redacted]

'ER V.

id 1477. To provide and fix in the entrance-hall, the principal corridor, and the assembly-room, columns according to the drawings, with shafts of 2 in., yellow deal firmly glued and blocked together with bases of yellow deal and with capitals accurately formed of ———, and secured firmly to the shafts.

1478. The capitals of the internal columns and pilasters, may be of plaster or glue-putty composition, or they may be of wood, or principally of cast-iron.

1479. The use of wooden columns should be as much as possible discouraged; it is true that small internal fluted columns of stone are liable to be damaged, but as they are mostly painted this damage can be repaired. Wooden columns formed of very small pieces glued together, are very subject to start apart by damp destroying the glue; and columns formed of solid timber are liable to acquire a rough surface by the cracking and opening of the grain of the wood in seasoning. (See §§ 551—557.)

1480. To provide and fix the several pilasters according to the drawings, with shafts of 1¼-in. yellow deal grooved cross-tongued glued and blocked, and with moulded bases and capitals.

1481. If the pilasters be swelled or be fluted, they will require to be thicker in proportion, and if they project more than the thickness of the wood, they will require to be mitred at their angles.

1482. If there are to be any cores of wood or iron concealed within the columns, the Specification must contain an explanation accordingly.

1483. Also if there is to be any trussed-work of timber or iron concealed in the entablature, the Drawings and Specification must contain the requisite explanation for it.

(See Index.)

ons. (See Index.)

(See Index.)

(See Index.)

(See Index.)

m. (See Index.)

s. (See Index.)

fir- (See § 1071.)

k. (See § 1070.)

PLASTERER.

L. P. F. and S. to ceilings.

1484. To lath plaster float and set ceilings to each story above the basement story, throughout the whole of the buildings (except to the coach-houses.)

L. P. F. and S. quartered-partitions.

1485. To lath plaster float and set, the quartered-partitions on the attic stories of the buildings.

Render float and set.

1486. To render float and set the brickwork of the attic stories of the buildings.

Rough stucco.

1487. To plaster the sides of the kitchen and of the office-passages, with the best floated rough stucco lathed where requisite.

Trowelled stucco.

1488. To plaster the sides of all the remainder of the ground-story, and one-pair story, with the best floated and trowelled stucco lathed where requisite.

Cornices, decorations, &c.

1489. To run round the ground-story and one-pair story of the principal building, the several plaster cornices with enrichments according to the drawings; and to execute in like manner the several plaster entablatures and other mouldings and decorations.

To form all the panelled-work, beams, arches, and margins, in gauged stuff; and to provide and fix in the situation shown by the drawings, the several flowers properly modelled.

Parker's cement skirting.

1490. To form round the kitchen and other plastered offices, and round the office-passages, lobbies and closets, skirtings of Parker's cement stucco 9 ins. high, and 1¼ in. thick, whitened while yet wet and when dry teinted stone colour.

Whiting.

1491. To whiten the whole of the ceilings, mouldings, entablatures, flowers, and other plaster enrichments.

If any of the best plasterer's work is to be teinted of any colours, such work will be better performed in distemper by the painters.

Colouring.

1492. To finish of such teints of stone-colour as may be by the architect directed, the plastering to the sides of the rooms closets and passages of the attic-story.

Lime-whiting.

1493. To stop and lime-whiten twice the whole of the stables and coach-houses, the lofts, the harness-room, the larder, the scullery, and of the cellars, including all the timbers floors roofing and vaulting above the same.

PLUMBER.

7 lb. gutters

(See § 1423.)

7 lb. flats.

(See § 1424.)

4 lb. milled-lead flashings, 5 ins. wide.

(See § 1426.)

5 lb. milled-lead step-flashings, 12 ins. average width.	(See § 1201.)
5 lb. milled-lead to hips and ridges, 18 ins. wide.	(See § 1427.)
5 lb. milled lead to dormers.	(See § 1428.)
6 lb. milled-lead round sky-lights.	(See § 1427.)
5 lb. milled-lead to external wood cornices (if any).	(See § 1207.)
Cisterns.	(See § 1211.)
Sinks.	(See § 1211.)
Water-closet apparatus.	(See Index.)
Common water-closets.	(See Index.)
Laying on water.	(See § 1212.)
Pumps (if any).	(See Index.)
Cold-bath.	(See Index.)
Hot-bath.	(See Index.)
Iron eaves'-guttering (if any).	(See Index.)
Copper eaves'-guttering (if any).	(See Index.)
4-in. R. W. P.	(See Index.)
3½-in. R. W. P.	(See Index.)
3-in. R. W. P.	(See Index.)
Extra lead-work.	(See Index.)
Copper nails.	(See Index.)

PAINTER.

Preparation.

1494. To knot with silver leaf, stop, pumice smooth in every part, and prepare properly, all the wood-work, stucco-work, iron-work, and other works, which are intended to be painted.

5 times in oil.

1495. To paint five times with the best oil-colour all the iron-work of every kind throughout all the buildings and their fittings and appertenances, the first two coats of colour being done with red lead paint.

4 times in oil.

1496. To paint four times with the best oil-colour, all the stucco-work and all the internal and external wood-works and other works which are usually painted, throughout all the buildings and their fittings and appertenances.

Imitation of wainscot.

1497. To comb finely and grain in the very best manner in imitation of wainscot the whole of the doors and door-linings, and the wainscottings, skirtings, shutters, sashes, and other wood-works of the windows to the .

Imitation of mahogany.

1498. To paint in the very best manner in imitation of mahogany the doors and of the .

Imitation of marble.

1499. To paint in the very best manner in imitation of marble the columns, pilasters, and of the , and to paint in the very best manner in imitation of marble the columns, pilasters, and of the .

Varnishing.

1500. To varnish with the very best copal the whole of the imitations of wood and marble, the columns and pilasters having eight (or less as the case may be according to the goodness of the work) coats of varnish, each coat of varnish polished thoroughly to a perfect gloss, and all the other imitations having two coats of varnish.

Flatting.

1501. To flat extra the wood-work of the and the whole of the stucco-work; the wood-work of is to be finished in three teints.

Colours.

1502. The sashes are to be finished on the outside thereof dark purple brown: all the other painting is to be finished of such teints of stone-colour or other colours of equal value as the surveyor shall direct.

GLAZIER.

Plate-glass.

1503. To glaze the windows of the coffee-room and of the with the best clear polished plate-glass.

Best Newcastle glass.

1504. To glaze the windows of the assembly-room, the sky-lights to and the windows of all the remainder of the ground story and one-pair story (those to the kitchen offices and those to the excepted) with the very best Newcastle glass.

Ground-glass.

1505. To glaze the windows of the water-closets and of the with the best Newcastle ground-glass.

Stained glass.

1506. To glaze the window of the principal staircase and of the with stained glass according to the drawings.

2nd Newcastle glass.

1507. To glaze all the remainder of the windows, sashes, and lights throughout the buildings with good 2nd Newcastle crown glass.

Cleaning, &c.

1508. The whole of the glazing is to be properly bedded, bradded, and back-puttied, and is to be cleaned and left perfect immediately before the final rendering up of all the other works as complete.

CHAPTER VI.

FORM OF SPECIFICATION *to be inserted in an* AGREEMENT *for the* PURCHASING *of or for* TAKING UPON LEASE *a* HOUSE NOT YET FINISHED, *according to which specification the House is to be finished by the builder prior to the execution of the lease or conveyance.*

PARTICULARS *for finishing a House and Premises situate on the West side of the Road from , the carcase of which house is already erected, being the most southern of three houses which are now being constructed by Mr. , at the southern extremity of a piece of ground which he holds of .*

ROOFS.

1509. To take off the present covering of the roofs, to lay all the gutters of the premises with inch yellow deal gutter-boards and 7 lb. cast-lead (or 6 lb. milled-lead, as the case may be) with current 1½-in. to every 10 ft. run, and with 2½-in. rebated drips; to batten all the roofs with ¾-in. yellow deal, and to slate the whole of the roofs with the best Countess slates nailed with copper nails, pointed on the inside with stone lime mortar with hair therein, and filleted with Parker's cement, cast-iron nails being first driven into the brickwork to secure the filleting.

ATTIC STORY.

1510. To lay the floors with inch white deal (or yellow deal, as the case may be) clear of sap-wood; to fit up the windows with 1¼-in. yellow deal ovolo sashes glazed with 2nd Newcastle crown glass and double hung with large patent lines, iron weights, iron pulleys, and spring fastenings, in deal cased frames with English oak sunk sills; to put round the windows ¾-in. tongued and beaded and quirked linings; to fit up the doorways with 1¼-in. yellow deal square framed four-panel doors hung in 1¼-in. beaded and single rebated linings; to skirt the whole of the story with ¾-in. yellow deal, 6 in. high, plugged to the walls; to put ceiling-joists 8 in. by 2 in. spiked in one length beneath the binders of the roof. To lath plaster float and set the ceilings and quartered partitions of the whole of the story; to render float and set all the brickwork, to whiten the ceiling, to colour the sides of the back-room and of the closets, and to hang the walls of the front-room and of the closet thereto attached with figured paper cut close, value 1½*d.* per yard.

TWO-PAIR STORY.

1511. To lay the floors with inch white deal (or yellow deal, as the case may be) clear of sap-wood; to fit up all the windows with deal cased frames with English oak sunk sills, and 2-in. yellow deal ovolo sashes glazed with 2nd Newcastle crown glass, and double hung with the best large patent lines and iron weights

and iron (or brass, as the case may be) axle-pulleys, and inch square framed window-backs and ¾-in. yellow deal window-linings; to provide and hang 1¼-in. yellow deal four-panel moulded and square framed doors with 1¼-in. yellow deal double-rebated linings; to put inch yellow deal grounds and also moulded architraves round the windows and on both sides of each door; to put to each room a Portland stone chimney-piece, with a slab of 2-in. Portland stone, wood (or stone, as the case may be) mantle-shelf and dressings and a rubbed Yorkshire stone hearth; to put two closets in the front room with 1¼-in. square framed (or moulded, as the case may be) fronts and doors with mouldings round the doors to correspond with the architraves, and with three shelves in each closet; to skirt the rooms and the closets with ¾-in. yellow deal 8 ins. high, fixed with proper ploughed grounds; to lath, plaster, float, set, and whiten the ceilings; to run a plain cornice 8 ins. girth round each room; to lath the partitions and to plaster, float, set, and hang with paper of the value of 5*d.* per yard and border 3*d.* per yard all the sides of the rooms and closets.

ONE-PAIR STORY.

1512. To lay the whole of the story with inch (or 1¼-in., as the case may be) yellow deal floor clear of sap-wood; to fit up the windows with deal cased frames, with English oak sunk sills, and 2-in. yellow deal astragal and hollow sashes glazed with the best Newcastle glass, and double hung with large patent lines, brass axle-pulleys, and iron weights, 1¼-in. moulded window-backs, elbows, and soffits, 1-in. bead-butt back-linings, and 1¼-in. moulded and square-framed shutters and back-flaps, hung with strong hinges, brass furniture, and strong spring shutter-bars complete, in 1¼-in. proper boxings with mouldings to correspond with the door-architraves; to provide and hang 2-in. yellow deal four-panel moulded doors with the best mortise-locks with brass furniture, in 1¼-in. yellow deal double-rebated linings, with grounds and architraves on each side complete as described to the two-pair story; to put round both rooms moulded skirtings 1 ft. 2 in. high with inch yellow deal plinths, ploughed grounds and backings complete; to put a closet in the back room the same as described for the two-pair story, moulded to correspond with the other joiner's work of this story; to put 2½-in. rubbed Yorkshire stone hearths, a good chimney-piece and slab of veined marble in the front room value £7, exclusive of the carriage and fixing, and a 2-in. Portland stone slab and a good Portland stone boxed chimney-piece in the back room; to lath, plaster, float, set, and whiten the ceilings; to put a cornice round each room 15 ins. girth, with enriched soffit and bed moulding; to lath the partitions, and to plaster, float, set, under-line with strong cartridge-paper and hang with figured paper value 10*d.* per yard, and border value 3*d.* per yard all the sides of the rooms and of the closets.

GROUND STORY.

1513. To fit up the sides of the fire-places, with four dwarf closets with 1¼-in. moulded fronts and doors, inch Spanish mahogany moulded tops with mahogany skirtings over the same, and

to put one shelf in each closet; to form folding-doors between the two rooms to correspond in finishing with the other doors; to put in the rooms two good chimney-pieces of veined marble, with Yorkshire stone hearths and Portland stone slabs, value altogether to the two chimneys £12., exclusive of the carriage and fixing; to put to the back parlour 2 in. yellow deal moulded French casements hung in fir proper door-cases with English oak sunk sills; and in other respects to fit up both rooms as described for the one-pair story.

KITCHEN.

1514. To put at the sides of the fire-place, two closets with three shelves in each thereof; to lay the floor with 1¼-in. yellow deal listed free from sap-wood on fir joists, English oak sleepers and brick piers, with the ground excavated full 6 ins. below the sleepers; to put inch yellow deal square skirting 6 ins. wide (or skirting of Parker's cement as the case may be), to fit up the window, with 1½ in. ovolo sashes glazed with second Newcastle glass complete, and double-hung with large patent lines iron weights, and iron pullies, in deal-cased frames with English oak sunk sills; to put 1¼-in. bead-butt and square-framed outside shutters, hung with strong hinges and bolts complete; to put an 1¼-in. yellow deal four-pannel moulded and square-framed door, with lock and hinges, and 1¼-in. linings with mouldings round the same; to put a 2-in. Portland stone chimney-piece, and a 2-in. Portland stone slab, wood mantle-shelf and dressings, and 2½ in. Yorkshire stone hearths; to lay on the water with ¾-in. strong lead pipe; to provide and fix a cistern to contain 100 gallons; with a case of 1½-in. yellow deal, and line the bottom thereof with 8 lb. cast-lead, and the sides thereof with 5 lb. milled-lead (or as the case may be, a cistern of strong slate secured together by sufficient copper bolts), to put over the cistern a cover of ¾-in. yellow deal; and to put a Yorkshire stone-sink with strong 2-in. waste pipe, and brass bell-trapped grate thereto complete; to provide and fix a good dresser with 2-in. clean deal top, inch yellow deal pot-board, and with drawers shelves and cut-standards complete; to lath where requisite plaster set and whiten the ceiling, and plaster set and colour the sides of the kitchen, and of the closets attached thereto.

CELLARS.

1515. To repair and make good all the vaulting, with the requisite new sound stock-bricks, and to point the brickwork where requisite; to inclose the cellars with new brickwork and inch yellow deal cross-tongued and ledged doors in fir proper door-cases 4 ins. by 5 ins., with strong hinges and copper-warded stock-locks; to pave all the cellars with hard stock-bricks laid flat in mortar, and grouted between the joints with liquid mortar; to fit up the wine-cellar with two tiers of 3-in. Yorkshire stone shelves 2 ft. 8 in. wide, and with bearers of 3-in. Yorkshire stone; and to fit up the coal-cellar door with 1¼-in. yellow deal sliding coal-boards 4 ft. high.

WATER-CLOSET.

1516. To fit up the water-closet, with apparatus cistern pipes Honduras mahogany seat riser and flap, door, skirting, floor, plastering, and paper-hanging complete. (See Index for water-closets.)

STAIR-CASE and PASSAGE.

1517. To put inch clean yellow deal steps, risers and landings with returned moulded nosings, 1¼-in. yellow deal, sunk moulded cut and mitred string-boards, strong square bar-balusters, each tenth baluster being of wrought-iron, turned and framed newels, moulded hand-rail of Spanish mahogany up two stories and of deal to all the remainder of the stair-case, curtail-step and scroll at the ground-story, windows the same as to the two-pair story, ¾-in. yellow deal torus-skirting with grounds complete, plaster-moulded block cornice, arch and two enriched plaster-trusses in the passage; to lath where requisite, plaster, float, set and whiten the ceilings and strings; and to plaster, float, set and hang with figured paper, value 6d. per yard cut close, all the sides of the stair-case and passage from the basement story upwards (or stucco and paint four times as the case may be.)

OUTSIDE.

1518. To make perfect all the brick-work; to cut out and make good in a secure, neat, and workmanlike manner with new sound bricks and new quick Parker's cement to all the settlements over the front entrance and ; to inclose the fore-court as to the adjoining house with iron rails, gate, and Portland stone curb; and to provide and lay two courses of 2½-in. Yorkshire paving outside the railing; to put a Portland stone solid step to the principal front door-way and 2½-in. Yorkshire stone paving 4 ft. wide from the outer gate up to the principal front door-way; to put solid Portland stone steps from the back parlour window to the garden.

1519. To raise the south garden-wall 2 feet higher with new grey stock brick-work set in stone-lime mortar; to inclose the east end of the intended garden with a wall to correspond with the south garden-wall when raised; to rake out, point with stone-lime mortar, and make complete all the present walling round the intended garden; and to finish all the garden walls with brick-on-edge and double plain tile cresting, both set in and jointed with good quick Parker's cement and Thames sand mixed together in equal measures.

GENERALLY.

1520. To make perfect the whole of the carcase, providing for that purpose all requisite new Baltic yellow fir-timber, all requisite new brick-work, and all other requisite materials; to complete

the cellar with all fittings requisite thereto; and to finish the whole of the house and premises with all labour, materials, ironmongery, and joiner's work and other works whatsoever which may be necessary for rendering the whole of the house and premises complete, though not particularized in this specification; to paint four times with the best oil-colour as may be directed the whole of the internal and external works usually painted, and to flat extra in three teints to match the paper all the joiner's work of the ground story and one-pair story; to make all requisite cess-pools, drains, and water-courses; and to leave the whole of the house and premises fit for occupation, with all the locks, keys, hinges, brass-work, appertenances, fittings, and fixtures in every respect complete and to the satisfaction of such surveyor as may be appointed by the (lessee) to superintend the same.

CHAPTER VII.

ECIFICATION *for the erection of* AN ADDITIONAL STORY, *for other additions, and for alterations and repairs to the house and premises No.* , *belonging to* , *according to the following drawings*:—

No. 1. The plan of the basement story.
2. The plan of the ground story.
3. The plan of the one-pair story.
4. The plan of the intended new attic story, and of the roofs over the low buildings.
5. The plan of the roof over the attic story.
6. Cross section of the house.
7. Elevation of the principal front of the house.
8. Details of the intended new shop-front.
9. Section of the large external cornice and pediment.

BRICKLAYER.

otice, &c. to strict-surveyor, &c.

1521. To give to the District-surveyor and to all the other public officers concerned in the execution of the intended works the requisite notices, to obtain all requisite licences, and to pay to the District-surveyor and to the other public officers their proper fees and charges.

king down, &c.

1522. To take down the parapets and as much of the other brick-work of the house and premises as may be unsound, or which will of necessity require removal in order to carry into effect the intended alterations and additions to the house and premises.

gging, cartage, &c.

1523. To remove from the basement story all the subdivisions thereof, and to remove from all round the four walls the ground and brick-work and other materials and things at present lessening the dimensions of the cellarage. (This cellarage had extended only partially under the site of the house.)

1524. To excavate the basement story with the new vaults and areas intended to be thereto attached, so that the story may be

8 ft. deep below the upper surface of the ground flooring; and to dig out for the foundations of the intended new brick-work, and as may be otherwise found necessary.

1525. The ground is to be removed to full 12 ins. below the paving and boarded floor of the ground-story of the back buildings.

1526. To beat down and consolidate the ground under all the footings; to fill in again and consolidate the ground to the brick-work, and as may be otherwise found necessary to the house, buildings, and premises.

1527. To remove and cart away all the superfluous earth, ground, useless materials, and rubbish, and leave the whole of the house, buildings, and premises finally clear from rubbish.

Indents, &c.

1528. To cut and parget in the old brick-work perpendicular indents where requisite in order to receive the intended new brick-work; and to make good in a sound and workmanlike manner all damage which may be caused to the brick-work by cutting the said indents.

Under-pinning, &c.

1529. To under-pin and repair thoroughly in the most careful manner with new hard stock brick-work as may be found necessary the walls around the basement story.

Making good, &c. &c. with Parker's cement.

1530. To cut out carefully the brick-work for the reception of the breast-summer story-posts and granite sill of the intended shop-front, and to make good thereto in the most skilful and workmanlike manner with the requisite new brick-work.

1531. To cut out an opening in the back-wall of the basement-story, to arch over the same, to form an external area round the said opening with walls of 9-in. brick-work, and to put over the new area a grating of cast-iron with frame-work one inch square with strong flanges and with bars $\frac{3}{8}$-in. by 1 in. and not more than $1\frac{1}{2}$ in. apart.

1532. To cut out and make good the brick-work in like manner between the intended shop and counting-house, and between the front area and the basement; and to turn thereto arches of the thickness of the wall and 9 ins. wide in front; and to turn under the same openings counter-arches of the same description, but only of a segmental form rising 1 foot.

1533. To cut out the brick-work for the insertion of the girders binders plates and as elsewhere may be found necessary, and to make good the brick-work thereto.

1534. The whole of the brick-work to the above-described alterations and repairs is to be set in Parker's cement and clean Thames sand mixed together in equal measures.

General brick-work.

1535. To execute all brick-work requisite for forming and for completing the intended additions alterations and works to the house buildings and premises with the appertenances thereof. (See 990—91.)

[redacted]

APTER VII.

1536. To construct the intended two new vaults in brick-work 9 ins. thick with the spandrils over the same filled up to an altitude within 9 ins. of the inside of the vaulting with brickbats grouted in with liquid mortar.

1537. To stucco over ¾-in. thick with pure quick Parker's cement, the whole of the outside of the vaulting and the whole of the walls supporting the same.

eys, &c. 1538. To carry up the intended new chimneys according to the drawings, and to properly turn parget and core the same; to finish the chimney-shafts with salient-courses 6 ins. high and double plain-tile cresting; and to put over each flue a large sized chimney-pot flanched round with plain-tiles. The whole of the chimney-pots tile-crestings and tile flanchings are to be set in and to be jointed with new quick Parker's cement and clean Thames sand mixed together in equal measures.

1539. To put to the new fire-places on the ground-story fenders of 9 in. brick-work 18 ins. high to support the slabs, and to put to all the other new fire-places 4-in. brick trimmers.

1540. To take down and cut away very carefully the whole of the present chimneys of the front parlour and back parlour on the ground-story; to insert properly the four intended granite corbeilles for the support of the upper chimneys; and to bond in new brick-work as may be found requisite to the old brick-work so as to make the same complete together. The whole of the brickwork to this work is to be set in new quick Parker's cement and Thames sand mixed together in equal measures.

1541. To repair and re-set the present copper with wrought-iron furnace-bars, door, frame, fire-bricks, and all other requisite new proper work and appertenances complete.

esting, &c. 1542. To finish all the walls (which have not other copings) with brick-on-edge and double plain-tile cresting, both set in and jointed with new quick Parker's cement and clear Thames sand mixed together in equal measures.

ge. 1543. To open the ground, take up the present drain, and form an entire new barrel drain 12 ins. bore stuccoed on the inside over the lower half thereof ¾-in. thick with quick new pure Parker's cement leading through the whole length of the premises and carried quite into the public sewer, and to put from each soil-pipe rain-water pipe and sink a proper funnel. (See § 1104.)

d arches. 1544. To put to the front windows of the intended new attic-story, gauged arches to match the present gauged arches in the same wall, accurately cut and set quite closely, particularly at their soffits and backs.

arches. 1545. To turn to all the other openings the requisite arches, and tuck-point on their fronts and soffits all the external arches.

g. &c. 1546. To bed in mortar the plates lintels bond-timber templets and wood-bricks, and to bed and point with lime and hair

mortar the door-cases window-frames and all the other things in or about the house buildings and premises which will so require.

Piers under the floors. 1547. To build under the sleepers of the new ground-flooring, brick piers not more than 3 ft. apart and each 9 ins. by 4 ins. and 9 ins. high with a foundation 6 ins. high 9 ins. by 9 ins.

Cross walls. 1548. To put under the paving of the intended new kitchen and of the closets lobby and staircase thereto attached, 4-in. brick cross walls 12 ins. high.

Core for pediment, &c. 1549. To form in rough brick-work properly cut, a core for the reception of the Parker's cement mouldings of the intended level and raking cornice of the pediment above the new attic-story.

Facings. 1550. To finish the external face of the new brick-work of the principal front of the house with hard bricks to match as nearly as possible the other bricks of the present front.

Tuck-pointing. 1551. To rake out clean and tuck-point in the very best manner, the whole of the external brick-work of the Eastern front of the house, the new brick-work thereof being stained to match the old brick-work thereof.

Other pointing. 1552. To rake out and point with stone-lime blue mortar, all the remainder of the old brick-work of the house buildings and premises.

½ rod extra brickwork. 1553. To provide and execute under the Contract half a rod reduced of brick-work extra, to be used in such additional works as the Surveyor shall direct; the value of such thereof as may not be so ordered to be used is however to be deducted from the amount of the consideration of the Contract after the rate of per rod reduced, and if any further additional brick-work be ordered by the said Surveyor, the same is to be performed by the Contractor at the like price of per rod reduced.

Bricks. 1554. To clean such of the present bricks as will of necessity be taken down or be removed from the present buildings and which will still remain sound and not broken into less than half-bricks; and to provide new hard well-burnt grey stock-bricks sufficient for completing the intended new brick-work with the sound old bricks above described and the intended new facing-bricks.

Mortar. 1555. The whole of the mortar is to be compounded in the proportion of one third by measure of the very best stone-lime and twice that measure of clean sharp Thames sand.

Grouting, &c. 1556. The whole of the brick-work is to be entirely flushed in at every course with mortar, and all the work more than 9 ins. thick is to be grouted at every alternate course thereof with liquid mortar, great pains being taken that the outer faces of the work shall not be stained.

Mode of doing the work. 1557. No four courses of the work are to rise more than one inch besides the height of the bricks; the external principal front

is to be built in manner of Flemish bond; all the other brick-work of every kind is to be built in manner of English bond through the whole thickness of the work without any of the ties being broken. (See §§ 353—65 and 1010.)

Jobbing-work.

1558. To perform to the house buildings and premises and to the appertenances thereof, all such bricklayer's work as may be necessary thereto in the nature of jobbing.

MASON. (See 265—295.)

Granite sill.

1559. To provide and bed all along under the story-posts of the shop-front a continuous sill 18 ft. 6 ins. long of the best Aberdeen granite parallel square curb 12 ins. by 8 ins. in not more than five pieces with all the joints thereof worked fairly and plugged with lead; and to cut out in the top of the granite curb mortise-holes to receive the bases of the story-posts and columns.

Chimney-corbeilles.

1560. To provide and insert for the support of the chimneys of the one-pair story of the house four corbeilles of granite curb each 12 ins. by 9 ins. and 18 ins. long.

Stone for external cornice.

1561. To provide and bed in the new brickwork of the principal front a course of Yorkshire stone 20 ins. wide, for forming thereon the intended external cornice and pediment above the new attic story.

Note.—If any of the present front coping will serve instead of the Yorkshire stone above described, the same may be used in the cornice.

Window-sills.

1562. To put to the front windows of the intended new attic story sills of Portland stone 9 ins. by 5 ins. properly sunk weathered and throated; and to put to all the other new windows, sills of 3 ins. Yorkshire paving 9 ins. wide, wrought with fair edges and ends, and throated and laid sloping. (See § 1014.)

Paving of fore-court.

1563. To cover over the front area at the sides of the intended grated folding trap-doors, with 3½-in. tooled Yorkshire stone wrought with fair edges.

Public pavement.

1564. To make good the public pavement or to pay to the proper authorities such sum for so doing as they may require.

1565. To provide and let into the stone paving a strong cast-iron coal-plate with proper fastenings thereto.

Pavement of yard and kitchen.

1566. To take up all the present paving of the yard, and to pave the yard as it will be when reduced, and also the dust-bin, the kitchen, and the stair-case, the lobby, and the closet thereto attached, with new 2½-in. Yorkshire stone and the present Yorkshire stone paving all with the joints thereof wrought fairly through the whole thickness of the stone and laid in regular courses.

Sinks, &c.

1567. To put in the paving of the yard and kitchen, two five-hole sink-stones each wrought out of a piece of 4 ins. Yorkshire

stone 16 ins. square; and to refix and make complete in the kitchen the present sink.

To provide and let into the paving two very large square trapped iron gratings.

Cisterns.

1568. To put over the kitchen-sink, and at the upper part of the closet adjoining to the Eastern water-closet, two strong Yorkshire stone cisterns each containing 150 gallons and cramped together with copper, made perfectly water-proof and fixed complete with all requisite bearers and with the proper pipe-holes cut therein.

Chimney-pieces.

1569. To remove, alter as may be found requisite, repair, clean, refix in the back room on the one-pair story, and make complete, the chimney-piece at present in the front room on the ground story; and to alter as may be found requisite, repair, refix, and make complete to the new fire-places, such of the present chimney-pieces (to be taken down in order to make the intended alterations) as will be suitable thereto; to provide and fix to the other new fire-places new jambs mantles and shelves all of the best 1¼ in. Portland stone 6 ins. wide; and to repair and make complete as far as may be found necessary the other chimney-pieces of the house.

Slabs.

1570. To put to the intended new fire-places such of the present slabs as will of necessity be removed from the present buildings and which will remain sound; and to provide and bed to the fire-places new slabs of 2-in. Portland stone 18 ins. wide sufficient to make up all deficiency.

Hearths.

1571. To put to all the intended new fire-places back hearths of 2½-in. rubbed Yorkshire stone.

SLATER. (See §§ 542—3.)

1572. To take off carefully the whole of the present slating of the buildings of the premises; to square such of the present slates as remain sound, and to slate all the new roofing of the buildings, including the curb rafters of the back-buildings, using the sound present slates, and providing the best new strong slates sufficient to complete the roofing.

1573. The whole of the slating is to be fixed with strong copper nails, and is to have proper bond in every part, particularly at the eaves and at the heading courses thereof, with proper cut closing-courses, instead of having slates laid lengthwise with narrow slips of slate between them.

1574. To point the inside of all the slating with good mortar, composed of stone-lime and Thames sand, and with sufficient hair therein.

1575. To cover the two spaces between the chimneys at the side of the North upper gutter with two layers of very strong slates bedded in Parker's cement.

1576. To repair and make good all damage which may, during the progress of the works, occur to the slating; and to leave the slating perfect and to the satisfaction of the surveyor at the final rendering up of the whole of the works as complete.

CARPENTER and JOINER. (See §§ 337—40.)

Materials, &c.

1577. To provide sufficient new materials for and frame and fix all carpenter's work and joiner's work of every kind (complete with all proper nails spikes screws and other proper ironmongery of the best quality) which may be requisite for carrying into effect and for finishing in every respect the works of the intended additions alterations and repairs to the house and premises.

Timber and deals.

1578. All the oak-timber is to be of the best English growth; all the other timber is to be the best yellow fir either from Dantzic, Riga, or Memel; all the floors, joiner's work, and other wood-work, are to be of the best yellow Christiana deal except where herein otherwise directed. All the timber and deal are to be cut out quite square and perfectly free from the least sap-wood in any part thereof, and from shakes, large knots, and all other defects; none of the joists, ceiling-joists, rafters, or quarters, are to be respectively more than 12 ins. apart.

Present materials.

1579. The sound portions of the present timber-work and other wood-work may be used in the performance of the intended additions alterations and repairs to the house buildings and premises as far as the same may agree in scantling thickness dimensions nature and fashion with the materials described in this specification.

Sundries.

1580. To provide and fix 4 cwt. of iron in such stirrups screw-bolts ties and other light wrought and hammered work as the surveyor may direct. All additions to the quantity of iron-work and all deductions therefrom are to be taken at the rate of per pound including the fixing thereof.

To provide and fix all requisite temporary and permanent shores and struts, all requisite fillets tilting-fillets beads stops rebated angle-staves blocks bearers furrings templets and other proper and usual fittings, and to provide all requisite workmanship and to perform all the rebating tonguing grooving beading scribing housing framing planing and other labour usual and proper in or about carpenter's work and joiner's work.

Shoring.

1581. To provide, fix, alter, as occasion may require, and finally remove all such needles and shoring as may be requisite in order to support properly and effectually the house, buildings, and premises, and every thing therewith connected, during the cutting out for and the insertion of and the making good to the intended new breast-summer columns and story-posts, and during the performance of the other intended works and alterations to the house, buildings, and premises, so as to prevent accident or injury thereto or to any adjoining property.

ntering.

1582. To provide, fix, ease when so directed by the sur-

voyor, and finally remove, centering and turning pieces sufficient for constructing the intended new vaults and all the intended new arches and brick trimmers.

Ground flooring.

1583. To take up and remove the whole of the present flooring of the ground-story of the house and premises, and to put over the basement-story an entirely new flooring of 1½-in. yellow deal listed free from sap-wood, wrought on the upper side, ploughed and tongued with wrought-iron $\frac{3}{16}$-in. by 1½ in. and laid upon fir joists 6 ins. by 2 ins. in one length from east to west and bridged upon four binders of fir 12 ins. by 8 ins. and two end binders of fir 12 ins. by 4 ins.

1584. The ground floor is to have a large trap-door therein hung with very strong wrought-iron joints and a strong flush ring; the well-hole of the trap-door is to have inch deal linings round it; and the contractor is to provide and fix a framed and wrought step-ladder of 1½-in. deal with a strong guard-rail with proper standards to lead from the ground-story to the basement-story.

1585. To lay to the intended new counting-house, parlour, and water-closets, and to the staircase and to the closets thereto attached, boarded flooring with joists upon sleepers not more than 4 ft. apart, all composed of the sound parts of the present timbers and boarded-flooring of the ground story, but made complete and perfect with as much new materials as may be found requisite.

One-pair flooring.

1586. To take up the present boarded floor of the room over the present kitchen; to fill in and complete the joists and other timbers of the present one-pair story; to construct flooring to the remainder of the one-pair story as intended to be enlarged, with plate 4 ins. by 3 ins. joists 6 ins. by 2 ins. and trimmers and trimming-joists 6 ins. by 2½ ins., and to lay the whole of the story with such of the present flooring-boards as remain sound and good and such quantity of new inch yellow deal listed free from sap-wood as may be requisite for making up all deficiency.

Attic floor.

1587. To construct to the intended new attic story of the house a floor with wall-plate 4 ins. by 4 ins. joists 9 ins. by 2½ ins. and trimmers and trimming-joists 9 ins. by 2¾ ins.; and to lay the whole of the story with inch yellow deal wrought and listed free from sap-wood.

Roofing over the lower buildings.

1588. To form roofing to the lower buildings, with wall-plates 4 ins. by 3 ins., two ties 9 ins. by 3½ ins., angle-ties each 3 ft. long and scantling 4 ins. by 3 ins., rafters 4 ins. by 2 ins., ridge and hips 1 in. by 8 ins., slate-battens ¾-in. by 2¼ ins., and ceiling-joists 3 ins. by 2 ins. spiked in one length beneath the ties: to construct the intended flat over the counting-house, water-closet, and a portion of the yard, with a girder 12 ins. by 6 ins. running North and South from wall to wall, with joists 4 ins. by 2½ ins. framed thereinto, with a well-hole for a circular sky-light, and covered on the outside with inch yellow deal boarding for lead with a gutter and rolls.

1589. The curb roofing on two sides of the flat is to be

formed as quartered-partitions with heads 4 ins. by 4 ins., posts 4 ins. by 3 ins., plate or tie all along above the door-way 4 ins. by 4 ins., braces or struts 4 ins. by 3 ins., quarters or rafters 4 ins. by 2 ins., and slate-battens ¾-in. by 2½ ins. (See § 1294.)

oofing. 1590. To construct the roofing over the intended new attic story with wall-plates 5 ins. by 4 ins., angle-ties each 4 ft. long 5 ins. by 3 ins., tie-beams 10 ins. by 3½ ins., rafters 5 ins. by 2 ins., ridge 1¼ in. by 8½ ins., slate-battens ¾-in. by 2½ in., and ceiling-joists 3 ins. by 2 ins. spiked in one length beneath the binders.

To form in the roof a dormer with fir frame-work and proper door-case 4 ins. by 4 ins., quarters and joists 4 ins. by 2 ins., inch yellow deal external boarding all over, ¾-in. yellow deal wrought, ploughed cross-tongued beaded and ledged inner trap-door and outer trap-door hung with ¾-inch deal beaded linings and with strong hinges, bolts, and all other requisite fittings and appertenances.

1591. To construct to the roofs, gutters as shown by the plans, with inch yellow deal bottoms on strong fir bearers, and laid to current 1½ in. to every 10 ft. and with 2½-in. rebated drips; and to put at the sides of the gutters ¾-in. deal lear-boards 9 ins. wide.

ed-partl- 1592. To construct the intended new quartered-partitions with heads and sills 4 ins. by 4 ins., tie-plates above the door-ways 4 ins. by 5 ins., posts 4 ins. by 3½ ins., braces or struts 3 ins. by 3 ins., quarters 4 ins. by 2 ins., and three tiers of inter-ties 1 in. by 2½ ins.

To take down the quartered-partitions of the ground-story and to inclose the staircase as shown by the plan.

To put beneath the joists of the one-pair story and immediately under the quartered-partitions between the front and back rooms of the house a new fir girder 14 ins. by 8 ins. fairly wrought all over and with a templet of oak at each end 2 ft. 6 ins. long and scantling 6 ins. by 4 ins. (See §§ 544—50 and 1050—51.)

deal ns. 1593. To put in the situations shown by the plans 2-in. deal framed partitions with three heights of panels of ¾-in. deal, no panel thereof being more than 10½ ins. wide: the partition between the counting-house and the shop is to be sashed.

Note.—The present deal partitions may be used again in the kitchen as far as applicable and sound; but the said partitions are to be altered, repaired, and made good, as may be found necessary.

gs. 1594. To skirt with inch deal 8 ins. high, plugged to the walls, the whole of the intended new attic-story and the whole of the back buildings of the house and their closets and all other appertenances.

staves. 1595. To put to all the projecting angles of the new plastered work proper rebated and quirked angle-staves.

ont, &c. 1596. To construct and fit up a new shop-front to the house with fir breast-summer 14 ins. by 12 ins. and 18 ft. 6 ins. long, three fir story-posts 12 ins. by 3½ ins. each with a cast-iron

socket-shoe weight 28 lbs., 2½-in. deal folding-doors moulded in front and bead-flush at the back framed to appear in three leaves, two leaves being hung next the party-wall, and one leaf next the window, with 4-in. strong wrought-iron lifting butt-hinges, four 12-in. barrel-bolts, a barrel-chain, and a very strong best 12-in. draw-back iron rimmed lock with strong plain brass furniture; 2½-in. best Spanish mahogany moulded sash French polished, 1½-in. best mahogany fan-light over the door, and sashes in the folding-doors, all made to correspond with the other mahogany sash; moulded transom; 1¼-in. deal pilasters with moulded capitals and bases, a pair of deal carved consoles, inch Honduras mahogany fascia in one piece 20 ins. wide; moulded cornice strongly bracketed and with inch deal cover-board and with lions' heads in cast-iron upon the crown-moulding thereof; 2-in. deal stall-board 20 ins. wide moulded in front; 1¼-in. deal bead-butt and moulded shutters two panels high, and wrought-iron rebated corner-shoes, shutter-lifts, strong wrought-iron bar with hinge joints hasps and all other secure and proper appertenances complete to the shutters: the folding entrance-doors are to have shutters to correspond with the other shutters, and with two stubs with sockets to each. To put inch deal tongued and beaded linings over the story-posts and breast-summer, and all requisite cradling grounds and other proper and necessary appertenances. (See §§ 325—27, 558—69, and 1282.)

1597. To provide and fix under the intended new breast-summer two cast-iron columns each 4 ins. diameter at bottom and 3¾ ins. diameter at top, and with plate-caps and bases also of cast-iron, 10 ins. square and 1½ in. thick.

1598. To put behind the fan-light four wrought-iron horizontal guard-bars one inch square securely fixed to the wood frame-work.

1599. To provide and fix in the stone paving before the shop-front a pair of wrought-iron flat trap-gratings with frames ¾-in. by ⅝ in. bars ⅝ in. by ¾ in. not more than 1½ in. apart, rebated iron outer frame, socket-hinges, and with fastenings value 10*s*.

1600. To provide and fix to the front external doors a handsome ornamental knocker, and to provide, let into the stone landing by the same door, and run thereinto with lead, a handsome shoe-scraper upon four feet.

Doors.

1601. To take down and repair the present front external entrance-door, and to adapt and re-hang the same at the foot of the principal staircase, with the hinges lock and all the other appertenances thereof made complete.

1602. To repair thoroughly, alter as occasion may require, and hang with hinges locks and all the other appertenances thereof made complete, the other doors of the premises severally in situations where the same will be appropriate, and to provide new 2-in. deal four-panel square-framed doors with ¾-in. deal panels, sufficient to complete the whole of the house buildings and premises; to hang the whole of the said doors with 4-in. butt-hinges, and to put to each door a strong best 7-in. iron rimmed lock with good plain brass furniture.

[redacted]

[APTER VII.

The two doors of the counting-house are to have ovolo sashes in the upper parts of them.

r-linings, &c. 1603. To put to all the door-ways the requisite linings of 1¼-in. deal single-rebated, framed, grooved, and with large quirked beads next the plastering.

dows. 1604. To fit up the intended new parlour and new kitchen with the windows (with the fittings, shutters, and other appertenances thereof) to be taken from the present two parlours on the ground-story of the house, the same being repaired thoroughly, altered as may be found necessary, and made complete.

To fit up the intended new closet-room on the one-pair story with the window at present by the first landing of the stair-case, repaired and made complete, and with a new oak weathered and throated sill to project 3 ins. before the slating, and with an 1¼-in. quirked bead all round on the outside scribed over the slating and a quirked bead all round on the inside next the plastering.

1605. To put to the intended enlarged window-opening on the first landing of the front staircase a pair of 2-in. deal ovolo French casements, hung with 4-in. butt-hinges and fastenings, value 5*s*., in a solid fir frame 4 ins. by 4 ins., with a rebated oak sill 4 ins. by 3½ ins.

1606. To fit up all the other new windows with 1½-in. ovolo sashes, double hung with large patent lines, brass axle-pulleys, iron weights, and patent spring fastenings, in deal cased-frames with oak sunk sills; and to put round all the said windows next the stucco inch quirked and rebated beads.

1607. To put in the leaded flat over the intended new counting-house, a metal conical skylight, with a large air-cap with brass-cased balance-weights and brass pulleys and patent lines, and deal circular curb and cradling, and all other proper fittings and appertenances complete.

1608. To shorten the present one-pair front windows, by taking away the upper row of squares of glass in the sashes, and by raising the sills sufficiently to reduce the frames in height thereto; to repair and make complete the same windows; to alter, adapt, re-fix, and make good all the appertenances of the same windows, and to re-hang the sashes thereof with new large patent lines.

1609. To clean from rust, repair, refix, and make complete before the one-pair front windows the present balconies.

ts. 1610. To construct the several closets as shown by the drawings with deal framed partitions as herein before described, to put to each closet an 1¼-in. deal square-framed door corresponding with the other adjoining doors, and hung with 3-in. butt-hinges and strong 5-in. closet-locks each with two keys, and each closet is to have the requisite stops and linings, and is to be fitted up on the inside thereof with four tiers of inch deal shelves as wide as the closet will admit, and securely fixed on proper bearers.

Dwarf closets.

1611. To take down from the ground-story the present four dwarf closets, to alter, re-frame, as may be found necessary, render uniform, and refix the same in the intended new parlour and new counting-house, with the fronts, shelves, and other fittings thereof.

Staircases.

1612. To alter the head of the upper staircase as may be found requisite, and to construct an additional flight of stairs from thence to the intended new attic story, with landings treads and risers of inch yellow clean deal, on strong bracketed carriages, and with string-boards, hand-rail, newels, balusters, and all other fittings and appertenances to correspond with those to the lower part of the staircase.

To take down, remove to the situation shown by the plans, repair thoroughly, alter as may be found requisite, and fit up and make complete and perfect the present staircase of the back-building of the premises.

Water-closets.

1613. To fit up the two water-closets with the present fittings repaired, re-worked, altered as may be requisite, and made complete.

1614. To put to the Eastern water-closet, moveable casings of inch deal sufficient to conceal the pipes, and with beaded grounds, buttons, and all proper appertenances complete.

1615. To form in the quartered-partition between the front water-closet and the cistern, a door-way, and to put thereto a door with linings and hinges, as described to the other closets, and to put to the same door a brass button.

Dust-bin.

1616. To put to the dust-bin a curb of oak 4 ins. by 4 ins. and a ledged door of 1¼-in. oak with oaken slides.

Dresser.

1617. To repair, alter as may be found requisite, refix in the intended new kitchen, in the situation shown by the plan, and make complete, the present kitchen dresser.

General repairs to the wood-work, &c.

1618. To examine in the most careful manner all the old timber-work, joiner's work, and wood-work generally, of the whole of the house buildings and premises, and to repair the same where necessary in the most complete and workmanlike manner, providing for that purpose all requisite new materials of the very best quality; to ease and re-hang such of the doors and windows as will so require, providing the requisite new hinges and large patent lines; and to prepare the whole of the wood-work properly for painting.

Ironmongery and brass-work.

1619. To take off all the locks and brass-work of the house buildings and premises; to clean, repair thoroughly, and re-fix such thereof as may turn out worth reparation, the good brass-work being first lacquered; and to provide and fix all brass-work, locks, and other ironmongery of the best plain quality, which may be requisite in order to complete the house buildings and premises.

20 cubic feet extra fir timber.

1620. To provide and fix under the contract 20 cubic feet of the best fir timber in joists, rafters, or quarters, to be used in such

additional works as the surveyor shall direct; the value of such thereof as shall not be so ordered to be used is however to be deducted from the amount of the consideration of the contract at the rate of per cubic foot; and if any further additional timber-work be ordered by the said surveyor, the same is to be performed by the contractor at the like price of per cubic foot.

Jobbing-work.

1621. To perform to the house, buildings, and premises, and to the appertenances thereof, all such carpenter's work and joiner's work as may be necessary thereto in the nature of jobbing.

PLASTERER.

Troweled stucco.

1622. To execute with the very best floated and troweled stucco, lathed where requisite, the whole of the sides of the intended additional story to the house, and the sides of the intended counting-house, parlour, and kitchen, of the new chambers over the same, and of the staircases and closets attached to the same. (See § 1077.)

New ceilings and strings.

1623. To put to all the intended new rooms, closets, staircases, and other new parts of the house, and to the two-pair story of the house, and also to the whole of the shop; new lathed, plastered, floated, set, and whited ceilings and strings.

Repairs to the present plastering.

1624. To wash, scrape from paper-hanging and white-wash, repair, and make good and complete as far as may be found necessary, all the remainder of the old plasterer's work of the front principal house; to remove from the present kitchen and from the other rooms and buildings in the rear of the front house, all the present plastering, and to prepare properly the work for the intended new stucco.

Whiting.

1625. To whiten all the ceilings, strings, reveals, and cornices of the house and premises.

1626. To lime-whiten twice the whole of the sides of the basement-story, including the vaults and areas thereof; and to lime-whiten twice in like manner, the whole of the timbers of the ground floor above the basement-story, and the underside of the flooring-boards of the same flooring.

External cornice.

1627. To execute the large upper external cornice, with the raking cornice of the pedestal above the same, in the best Parker's cement stucco, jointed and whited while yet damp, and afterwards when dry teinted of stone-colour.

1628. To form all requisite reveals, beads, quirks, and arrises.

PLUMBER.

Present lead-work.

1629. To take off from the roofs of the house and premises all the lead-work at present upon the same.

New 7 lb. gutters and flat.

1630. To lay all the new gutters and the intended new flat, with milled-lead weight 7 lbs. to the foot superficial, turned up full 5 ins. next the brickwork and full 9 ins. over the rafters.

4 lb. milled-lead to hips and ridges.

1631. To cover all the hips and ridges of the roofs with 4 lb. milled-lead 16 ins. wide, secured with strong copper nails and properly dressed down over the slates.

4 lb. milled-lead flashings, step-flashings, &c.

1632. To put in the brickwork round the gutters and round the leaded flat, flashings of 4 lb. milled-lead 5 ins. wide.

1633. To put in the brickwork round the headings and ends of the slating, flashings of 4 lb. milled-lead, average width 12 ins., and set step-wise to the raking parts of the slating.

5 lb. milled-lead to dormer.

1634. To cover the top and the sides of the dormer with 5 lb. milled-lead, turned down all round full 8 ins., and to put over the sill of the dormer-door a flashing of 5 lb. milled-lead 30 ins. wide.

6 lb. milled-lead to shop-front, 4 lb. flashings.

1635. To cover the cornice of the shop-front with 6lb. milled-lead turned up 5 ins. next the front of the house, and with a flashing of 4 lb. milled-lead 6 ins. wide, let into the brickwork.

Water-closets.

1636. To take up and remove the present water-closet apparatus, and the pipes and other appertenances thereof.

To put to the water-closet adjoining to the kitchen a white basin with a proper strong trap, and a short funnel leading into the drain.

To fit up and make complete the intended new water-closet adjoining to the counting-house with the present water-closet apparatus and appertenances, previously examined, cleaned, repaired, and made perfect, and such parts thereof as are deficient being wholly renewed in the best and most improved manner of which the circumstances will admit.

Laying on water, pipes, &c.

1637. To lay on the water from the pipes under the public-way, to the intended two cisterns, and from them to the two water-closets and to the sink, with very strong lead ¾ in. pipe, cocks, bosses, balls, and all proper appertenances; the cock to the western water-closet is to have a drop brass handle.

1638. To put from each cistern to the drain a very strong lead 1¼-in. waste-pipe; and to put from the sink to the drain a very strong lead 2½-in. waste-pipe, with a large brass bell grate at the top thereof.

Eaves' gutters and R. W. Ps.

1639. To put round the eaves of the low back buildings 4 in. cast-iron eaves' guttering, fixed on strong wrought iron brackets; and to put from the several gutters cast-iron rain-water-pipes 3½ in. diameter, fixed with heads and shoes complete.

1640. All the nails used in the plumber's work are to be of copper.

CHAPTER VII.

PAINTER.

Preparation.

1641. To knot with silver leaf, stop, pumice, smoothe in every part, and prepare properly, all the wood-work of the house and premises now painted or intended to be painted; and to prepare in like manner as far as necessary the stucco and other works of the house and premises.

4 times in oil-colour.

1642. To paint four times with the best oil-colour, all the new stucco work, all the plastered sides of the present front house, and all the new wood-work, iron-work, and other works of the house and premises which are usually painted: and to bring forward and paint in like manner all the old works at such parts thereof as will be altered or reworked: the first two coats of colour on the iron-work are to be red lead paint.

Twice in oil colour.

1643. To paint twice with the best oil-colour all the old wood-works and other works of the house and premises which usually are painted.

Flatting.

1644. To flat extra in three teints of stone-colour, all the painting of the front room on the one-pair story.

Colours.

1645. The sashes are to be finished dark purple brown; the other painting is to be finished of such teints of stone-colour, or of such other plain colours as the surveyor may direct.

Graining.

1646. To comb finely, grain in imitation of wainscot in the very best manner, and varnish twice with the best copal, the whole of the external wood-work of the shop-front and of the doors therein, the mahogany sashes only excepted.

GLAZIER.

Plate glass.

1647. To glaze with the best strong clear plate-glass the window, the door, and the fan-light of the shop-front.

Ground glass.

1648. To glaze the conical skylights over the intended new counting-house with the best ground glass.

2nd Newcastle glass.

1649. To glaze all the other windows, sashes, and lights of the house and premises, with good second Newcastle crown glass, and to cut out from the old windows sashes and lights, all the cracked and broken glass of every kind, and to make good the same with sufficient new 2nd Newcastle glass.

1650. All the new glazing is to be properly bedded, bradded, and back-puttied; all the old glazing of the house is to be re-puttied; and all the glazing of every kind is to be cleaned and left perfect at the final rendering up of the works as complete.

CHAPTER VIII.

SPECIFICATION *of Works to be done at the house and premises No.*
, for , in the erection of a NEW PARLOUR AND A NEW KITCHEN *at the rear of the said house, and in alterations to the shop and other parts of the said premises.*

(Here to follow a list of the Working-drawings.)

BRICKLAYER.

District-surveyor, &c.

1651. To give to the District-surveyor and to the surveyor of pavements the requisite official notices, and pay to them their proper official fees.

Pulling down.

1652. To take down and remove as much of the fence-walls of the yard, and as much of the other brickwork of the house and premises, as will be requisite in order to make to the buildings and premises the intended additions and alterations.

Excavating, &c.

1653. To excavate the ground of the whole of the present yard to the depth of 15 ins. below the present level of the basement story of the premises ; to excavate the ground also for the footings and all the other works which will so require ; and to fill in and ram hard the ground to all the footings and other works after the same are built.

Cartage, &c.

1654. To clear and cart away from the house and premises all the superfluous earth, rubbish, and old materials ; and to leave finally the house and premises clean and free from rubbish.

Brickwork for the new parlour, kitchen, &c.

1655. To cut and parget in the old brickwork proper perpendicular indents for the reception of the intended new brickwork.

1656. To erect according to the drawings the requisite brickwork for the intended new parlour and kitchen, with two courses of footings, 1 ft. 10½ ins. thick, and two courses of footings, 1 ft. 6 ins. thick, kitchen walls 1 ft. 1½ ins. thick, and walls round the parlour 9 ins. thick.

1657. To construct the fire-places, with the flues thereof properly turned, pargeted, and cored ; the kitchen fire-place is to have a chimney-bar of wrought-iron 3½ ins. by ½ in. ; the parlour fire-place is to have a chimney-bar of wrought-iron 2½ ins. by ¾ in. and a 4-in. brick trimmer ; each chimney-bar is to be properly corked on the outsides of the chimney-jambs ; the new flues are to be arched over as conveniently as possible, and are to be turned into and to be properly united with the flues of the present West chimney-stack of the house ; the two recesses at the sides of the parlour fire-place are from the dwarf-closets upwards to be formed in brickwork as semi-circular niches.

1658. To set in the kitchen a copper (to be provided by) with fire-bricks, wrought-iron furnace-bars and

door, and all other proper work and appertenances, and with a proper flue thereto.

1659. To set in the new fire-places, a kitchen-range and a parlour-stove, to be provided by .

1660. To build for the support of the paving of the new kitchen, cross walls of 4-in. brickwork 6 ins. high.

1661. To repair and make good to the new brickwork, the fence-walls and other adjoining old brickwork.

1662. To cut out for as far as requisite and bed and make good to the bond-timber, plates, wood-bricks, and lintels of the intended additions and alterations to the house and premises.

1663. To arch over the several openings in the brickwork, and to tuck-point the external arches.

closets, 1664. To build the brickwork requisite for the water-closets; to arch over in 4-in. brickwork the lower water-closet; and to erect from the new parlour to the water-closet a wall 6 ft. high above the stone-landing, with the upper course of the work set in Parker's cement.

-trap, &c. 1665. To construct in such situation as shall be by the surveyor directed, a stench-trap, value 20*s.*; and to arch over the cess-pool beneath the lower water-closet, and to put to the pan thereof a proper brick hopper set in and stuccoed on the inside thereof, $\frac{3}{4}$ in. thick, with pure Parker's cement.

t back wall house. 1666. To take down and cut away as much of the present back wall of the house as may require removal, in order to admit of the staircase folding-doors and other alterations as shown by the drawings; to repair, complete, fill in, and make good the said wall with sound hard stock-bricks set in new quick Parker's cement and clean Thames sand mixed together in equal measures.

s, &c. to und story, 1667. To repair and make good with brickwork to the walls of the ground-story wherever the same may be found defective, or may become so by the intended removal of the present works, and by the execution of the intended new works; and in like manner to make good in a workmanlike mode to the intended new shop-front.

t basement 1668. To excavate the whole of the present basement-story of the house to the depth of 15 ins. below the present average level thereof; to make good and under-pin carefully with sound stock-bricks set in new quick Parker's cement and clean Thames sand mixed together in equal measures, such portions of the sides of the basement-story as when the excavation is made will be found either defective or destitute of foundations, and to spread all over the basement-story a layer 6 ins. in thickness, composed in equal measures of smiths' ashes, pounded brick, and lime-core.

1669. To take down and clear away all the present lathing and plastering of the basement-story.

1672. To repair and stop the sides of the present basement-story particularly in the parts from whence the present fittings will be removed, and round and between the timbers of the ground-flooring, after the lathing and plastering are removed therefrom.

Cellar-entrance

1673. To rebuild and make good the brickwork round the cellar-openings, as far as may be found requisite in order to suit the new arrangement and the cellar-entrance as intended to be altered.

Extra brickwork

1674. To provide and execute under the contract, one fourth part of a rod reduced of stock brickwork to be used in such extra works as the surveyor shall direct; all additions to and all deductions from the quantity of extra brickwork are to be made after the rate of per rod.

Jobbing-work

1675. To perform in connection with the works herein directed to be done all such bricklayer's work as may be found requisite in the nature of jobbing.

Materials &c.

1676. The whole of the new bricklayer's work (except where herein otherwise directed) is to be done with sound new hard well-burnt square grey stock-bricks of the very best quality, free from admixture of soft bricks, place-bricks, or other inferior bricks, and laid in and entirely flushed up at every course with well-beaten mortar, composed of one third by measure of the best well-burnt stone-lime and two thirds by measure of clear Thames sand; the whole of the external brickwork is to be faced externally with bright picked stocks of an uniform colour, with the joints thereof neatly struck and drawn.

MASON (see §§ 265—295).

Window-sill.

1677. To put to the window of the intended new parlour a sill of 3 in. Yorkshire stone 9 ins. wide, wrought with fair edge and ends, throated, and laid sloping. (See § 1014.)

Landing, &c.

1678. To put from the new parlour to the new water-closet, a landing of 3 in. tooled Yorkshire stone, properly pinned into the brickwork, and guarded at the north side thereof by a wrought-iron rail 2 ins. by ½ in., and cast iron bars ¾ in. square, 3 ft. 6 ins. high, not more than 4 ins. apart, and let in the stone-work and run with lead.

1679. To cover the upper water-closet with a piece of 3 in. tooled Yorkshire stone, wrought with fair edges, throated, laid sloping, and with the requisite pipe-holes cut therein.

Sink.

1680. To put in the kitchen a sink of 7 in. Yorkshire stone securely fixed and cut out to receive the pipe and stench-trap.

Chimney-pieces.

1681. To put to the fire-place of the parlour, jams, mantle, and shelf, each of inch blue and white veined marble 6 ins. wide, internal and external slips of similar marble 4 ins. wide, slab of similar marble 2 ft. wide and 3 ft. 4 ins. long, and 2½ in. rubbed Yorkshire stone hearth.

[redacted]

APTER VIII.

1680. To put to the fire-place of the kitchen, jambs, mantle and shelf, each of 2 in. Portland stone, 8 ins. wide.

g, &c. 1681. To pave the whole of the present basement-story, and the intended new kitchen, and also the yard, with the best new 2½ in. Yorkshire stone worked and rubbed quite fairly on the edges, and laid in and jointed with Parker's cement in regular courses: to put in the yard a five-hole sink stone. (This paving was directed to be rubbed on the edges in order to prevent the access of vermin to the basement-story, which was intended for the warehousing of corn.)

1682. To pay to the Commissioners of Paving the expense of relaying and making good the public paving to the intended new shop-front and cellar-entrance.

SLATER. (See §§ 542—3.)

1683. To cover the roof over the intended new parlour with the best strong Duchess slating, lapped full 3½-ins., and secured with proper bond in every part thereof with strong copper nails; and to leave perfect at the rendering up of the works the whole of the said slating. (See §§ 1023—7.)

CARPENTER AND JOINER. (See §§ 337—340.)

d-timber and s. 1684. To put in the walls of the intended new parlour and kitchen four tiers of fir bond-timber 4 ins. by 2½ ins., and two wall-plates each 4 ins. by 4 ins., the wall-plates are to be continued all round the new brickwork, and are to be let into the old brickwork of the back-wall of the house.

or. 1685. To construct the floor of the intended new parlour with fir joists 6 ins. by 2¼ ins. fir trimmers and trimming-joists 6 ins. by 2¾ ins., and to lay the same with 1¼ in. yellow deal wrought folding floor clear of sap-wood.

f. 1686. To construct the roof with rafters 5 ins. by 2 ins., slate-battens 2 ins. by 1 in., and crown-plate 4 ins. by 3 ins. let into the old brickwork: the rafters are to be framed opposite the window of the one-pair back-room so as not to rise above the same, and the roof is to be made complete with all requisite other fittings. To prepare for the parlour-ceiling by putting horizontal ceiling-joists of fir 3½ ins. by 2 ins., so as to leave a clear height of 8 ft. 9 ins. in the centre of the room, and to put round three sides of the room blocks of fir 3 ins. by 1½ in., sloping to the same angle as the feet of the rafters, so as to cove the ceiling all round in a similar manner.

(*This is an example of a roof with an imperfect tie, which would have been wholly inadmissible if the span of the roof had been more than* 10 *feet, unless in that case there had been sufficient abutments.*)

tels. 1687. To put to the several openings the requisite fir lintels, each 4½ ins. high, of the width required by the brickwork, and

18 ins. longer than the bearing; and to provide and fix all requisite wood-bricks. (See § 1041.)

1688. To fit up the window of the new parlour with 1½-in. ovolo sashes glazed with second crown glass, and double hung with large patent lines, brass axle-pulleys, iron weights, and patent spring fastenings, in a deal cased-frame, with an English oak sunk sill; and to fit up the same window on the inside with a pair of 1¼-in. bead-flush and square framed shutters, hung in the same manner as the sashes in a proper cased-frame, with a moulding to form an architrave, and with 1¼-in. deal bead-flush three-panel window-back, with a beaded cover-board hung with 2-in. butt-hinges.

Windows.

1689. To fit up the window of the new kitchen with a pair of 2 in. deal bead-butt and square sashed doors with diminished styles, glazed with second crown glass, and hung each with three 3½-in. butt-hinges and a pair of strong dogs with sockets, in a fir proper frame 4 ins. by 5 ins. let at bottom into the stone-work and with a piece of 4lb. milled-lead 18 ins. square wrapped round the bottom of each door-post; and to put to the sashed doors inch deal tongued and rounded linings, four strong 12 in. barrel-bolts, a Norfolk thumb-latch, and 1¼-in. bead-butt and square framed shutters with wrought-iron corner-shoes stubbs and plates and strong thumb-screws.

Sashed doors from the shop.

1690. To fit up the large opening from the shop to the new parlour with a pair of 2 in. deal square framed and bead-flush folding sashed doors with diminished styles, glazed with second crown glass, and hung in 2 in. deal double-rebated linings, with 4 in. lifting butt-hinges, two 18 in. strong brass flush bolts, and a 6 in. best mortise-lock with good plain brass furniture; and to put round on each side of the doorway inch deal framed grounds 4 ins. wide with mouldings to form architraves.

Outer doors.

1691. To fit up the external doorway of the parlour with an 1¼-in. bead-flush and square framed four-panel inner door, hung with a pair of 3 in. butt-hinges a pulpit-latch and two 12 in. brass flush bolts, in 2 in. deal beaded and double rebated linings; and with a 2 in. deal bead-butt and square framed four-panel outer-door, hung with a pair of 4 in. rising butt-hinges two 12 in. barrel bolts a pair of strong dogs with plates and a 7 in. iron rimmed draw-back lock.

Closets.

1692. To fit up the two recesses at the sides of the parlour fire-place with dwarf closets, with good inch Spanish mahogany tops, 1¼-in. deal framed moulded and beaded fronts and doors, the doors hung each with a pair of 2½-in. butt-hinges and a good closet-lock; each closet is to have a bottom and shelf of inch deal, and all requisite bearers and other fittings.

Skirting.

1693. To put round the new parlour, inch deal skirting 8 ins. high rebated on the top and fixed with all requisite backings.

Stairs, &c.

1694. To cut out trim and make good the floors, and construct according to the drawings a new staircase from the ground-story to the one-pair story, and from the ground-story to the new kitchen, with 1¼-in. clean deal treads and risers, wrought

on both sides, and housed into 2 in. deal wrought string-boards and wall-strings; to inclose the sides of the two stair-cases with 1½-in. square framed partitions; and to put at the foot of the upper stair-case and at the head of the lower stair-case 1½-in. square framed four-panel doors, hung each with a pair of 3½-in. butt-hinges, and a good 7 in. iron rimmed lock with plain brass furniture; to put at the head of the one-pair stairs strong balusters hand-rail and turned newel; and to put to the stair-cases inch deal beaded apron-linings and all other requisite fittings and appertenances.

ter-closets. 1695. To inclose the upper water-closet with 2 in. bead-butt and square framing, 1¼-in. bead-butt and square framed six-panel door with the upper two panels thereof glazed with ground glass, hung with a pair of 3 in. rising butt-hinges a brass pulpit-latch a small bolt and beaded stops; to fit up the insides of both the water-closets with inch clean deal seats risers and clamped flaps and frames, square skirtings 4 ins. high, and all requisite bearers and pipe-casings; and to attend on the plumbers while fixing the basins and other work.

esser, &c. 1696. To put in the kitchen a dresser with a top of 2 in. clean deal 2 ft. 6 in. wide, free from sap-wood, and feather-tongued; framed legs and bearers, three drawers with brass drop handles, a strong good lock to the centre drawer; three 1¼-in. deal standards, three 1¼-in. deal sunk shelves, inch deal pot-board with bearers, and all requisite and usual other appertenances.

op, &c. 1697. To take down and clear away the present stair-case from the basement-story to the one-pair floor of the premises, and also the partitioning on the ground-story, and the closet on the East side of the shop fire-place; to fill in to the sites of the said old stair-case the timber floors with new fir of scantlings as great as those of the other timbers of the floors, to make complete the boarded floors thereto with 1¼-in. yellow deal clear of sap-wood; and to repair and make good all the other works injured or rendered incomplete by the said removal of the stair-cases and other works.

w shop front, 1698. To take down the whole of the present shop-front, and as much of the fittings and work therewith connected as may be found requisite; to alter and make good and complete the story-posts breast-summer and other timber-work of the shop-front, providing and using therein ten cubic feet of fir timber, and three cubic feet of English oak, all requisite oak wedges, and all requisite shores and struts; to provide and fix a new shop-front according to the drawings, with 2 in. lambs' tongue sash and fan-light both glazed with the best Newcastle crown glass, 2 in. deal stall-board 18 ins. wide, 1½-in. bead flush framing under the stall-board, 2 in. deal moulded and bead-butt folding-doors hung with 4 in. wrought-iron lifting butt-hinges, four wrought-iron dogs with sockets, four 15 in. barrel-bolts, a 10 in. best iron rimmed draw-back lock with solid brass furniture and a strong barrel-chain, 1¼-in. bead-butt and moulded shutters, strong wrought-iron shutter-bar with hasps staples locking-boxes pins and keys complete, strong wrought-iron corner-shoes and shutter-lifts to all the shutters,

[illegible] plasters, inch deal tongued linings to the door-way [illegible] and breast-summer, inch Honduras mahogany frieze, [illegible] cornice and other decorations of yellow deal according to the drawings, inch yellow deal cover-board, a pair of large carved and enriched consoles and all requisite cradlings furrings backs linings grounds and other work and labour and appurtenances complete.

1699. To provide and fix under the stall-board a pair of wrought-iron doors consisting of bars and frame-work ¾ in. square; to provide and fix in the paving under the iron doors, a pair of wrought-iron flaps, with bars 1 in. by ¾ in. not more than 1½-in. apart, and frame-work 1 in. square, and to put to the iron doors and flaps [illegible] value 20s., besides all requisite hinge-work; and to alter and make complete the curb of the cellar-entrance.

Jobbing work.

1700. To perform, in connexion with the works herein directed to be done, all such carpenter's work and joiner's work as may be requisite thereto in the nature of jobbing.

If more or less extra fir timber.

1701. To provide and apply under the contract 15 cubic feet of red fir timber, to be used in such joists or other similar work as the surveyor shall direct, all additions to and all deductions from the quantity of the said extra fir timber which may be by the surveyor ordered to be used are to be taken at the rate of per cubic foot, including the labour and workmanship thereof.

Materials.

1702. All the carpenter's work and joiner's work (except where herein otherwise directed) are to be of the best Baltic yellow fir and Baltic yellow deal; the whole of the materials are to be well seasoned, and free from sap-wood shakes large knots and other defects: the joists rafters and ceiling-joists are not to be respectively more than 12 ins. apart.

Iron straps &c.

1703. To provide and fix in and about the intended works [illegible] wt. of iron in such straps ties bolts and other light wrought and hammered work as the surveyor may direct; all additions to the said quantity and all deductions therefrom are to be taken after the rate of per lb. including the fixing thereof.

PLASTERER.

Ceilings, &c.

1704. To lath, plaster, set, and whiten a ceiling to the new kitchen.

1705. To lath, plaster, float, set, and whiten the ceiling and coved part of the new parlour, and to run round the crown and at the foot of the cove thereof a quirked bead one inch diameter.

Rendering.

1706. To render, set, and colour the sides of the new kitchen.

Stucco.

1707. To finish the sides of the new parlour, and the two niches at the sides of the parlour fire-place with the best floated and troweled stucco.

[redacted]

HAPTER VIII.

1708. To finish the sides and heads of the two niches with double quirked stucco beads.

irting. 1709. To run round the new kitchen a skirting of Parker's cement 1 in. thick, 8 ins. high, and teinted stone colour.

iking good, &c. 1710. To repair, make good, and wash, stop, and colour the sides of the whole of the ground-story and of the other parts of the house which will be damaged by the execution of the intended works; and to make good and repair, wash, stop, and whiten the ceiling of the ground-story and the other ceilings which will be in like manner injured by the execution of the intended works.

PLUMBER.

ashing, &c. 1711. To put at the head of the roof over the new parlour a flashing of 5 lb. milled-lead 14 ins. wide, let into the brick-work, and properly secured; and to put to the roof at the part opposite the window of the one-pair back-room, a piece of 5 lb. milled-lead 3 ft. wide, turned up at the ends thereof, and dressed to the window.

ves'-gutter and e, &c. 1712. To put to the eaves of the roof over the new parlour, and to the back eaves of the roof over the present attic story, 4-in. cast-iron troughs put together with white-lead and securely fixed on strong wrought-iron brackets; to put from the upper eaves'-gutter to the head of the lower roof, and from the lower eaves'-gutter to the paving of the yard, cast-iron 3-in. rain-water-pipes with heads and shoes and fixed complete; and to put over the slating of the lower roof from the shoe of the upper pipe to the head of the lower pipe a trough of 1¼-in. yellow deal 6 ins. wide and 4 ins. deep inside and lined with 6 lb. milled-lead.

aste-pipe, &c. 1713. To put from the sink in the kitchen to the drain a very strong lead 2½-in. waste-pipe with a large brass bell trap-grating at the head thereof.

ater-closets. 1714. To fix in the lower water-closet, and make complete with a trap and the other requisite work, a pan to be provided by , to provide and fix in the upper water-closet a blue basin with a cast-iron trap; to put from the two basins to the drain 5-in. funnel-pipes of 8-lb. milled-lead; to lay on with strong ¾-in. lead pipe the water from the street to the cistern intended to be provided by , and to be placed over the upper water-closet, and from thence to each water-closet, and also to the sink, with brass cocks and all proper appertenances complete; the cock to the upper water-closet is to have a strong brass drop-handle thereto.

op-front. 1715. To cover the cornice of the shop-front with 6 lb. milled-lead turned up 6 ins. high against the brick-work; and to put thereto a flashing of 4 lb. milled-lead 5 ins. wide effectually secured to the brick-work.

PAINTER, &c.

[illegible]

1714. To clean, stop, prepare properly, and paint four times with the best oil-colour, the whole of the intended new wood-work, iron-work, stucco-work, and the other works which are usually painted.

Painting

1715. To finish with flatting of such colours as may be directed the stucco-work and the wood-work of the parlour.

Colours, &c. of the shop-front, &c.

1716. To finish the sashes and the freize of the shop-front with vermilion: to finish the doors and the shutters in the best manner in imitation of wainscot: to finish the remainder of the shop-front in stone-colour: and to varnish twice with the best copal the whole of the painting of the shop-front.

Joining work

1719. To repair and touch up all such of the painter's work of the house and premises as may by the execution of the intended works be injured or be otherwise made defective or incomplete.

Glazing

1720. To take out of the windows of the one-pair story all the discoloured squares of glass now therein, and to re-glaze the same with as with sufficient new glass to match in colour the remainder of the glass. To make good all damage to the other parts of the house and premises which may occur thereto by the execution of the intended works.

CHAPTER IX.

A SPECIFICATION *for* REBUILDING THE TWO FRONTS, *erecting* AN ADDITIONAL ATTIC STORY *with a* LEADED FLAT *over the same, and for works to be done in the thorough repair of every part (the kitchen, and scullery, and the flat above the same only excepted) of a house situate at the corner of* , *and* , *for* ; *all which works are to be done under the direction of the surveyor who may be appointed, and according to the drawings signed with and forming part of the contract.*

(List of Working-drawings, see § 986.)

BRICKLAYER.

Notice, &c. to District surveyor, &c.

1721. To give to the District-surveyor and to the other public officers, the requisite notices and pay to them their proper official fees and charges. (See § 987.)

Take down 2 fronts.

1722. To take down to the under side of the intended new ground-flooring the whole of the front of the house next and the whole of the front of the house next .

1723. To sort carefully before any new brickwork is done, all the old bricks to be taken down from the present work, and to cart away instantly from the premises all the rubbish and soft and

broken and other defective bricks which the surveyor shall be of opinion are unfit to be again used in brickwork of a sound, proper, and workmanlike kind.

, &c. to kwork of :ment in s cement.

1724. To repair entirely with new, sound, grey stock-bricks, laid in a mixture of one-half Parker's cement and one-half clean Thames sand, all holes, cracks, and other defects in the brickwork of the entire basement story; to alter and make complete with new grey stock-bricks set in equal measures of Parker's cement and Thames sand, the areas as shown by the drawings and all such parts of the basement-story as will of necessity require alteration in order to carry into effect the works according to the drawings; to turn arches in mortar over all the basement openings.

ion to y.

1725. To alter and move the fire-place in the small South room on the ground-story as shown by the plan.

and &c.

1726. To cut quite perpendicularly and parget all indents and chases requisite for receiving the new brickwork; and to repair thoroughly, make good, and complete in a sound, neat, and workmanlike manner, all brickwork adjoining to the new brickwork, and which shall require any such work.

ork to ad- story.

1727. To take down as far as may be requisite, by reason of intended alteration, unsoundness, or other cause, the walls and other brickwork of every kind of the upper part of the building; and to erect all the new brickwork represented by the drawings, and which may be necessary for completing the additional story to the building; the flue of the new chimney is to be properly turned, pargeted, and cored; the fire-place is to have a brick-trimmer; all the chimney-shafts, party-walls, and back walls are to be finished with brick-on-edge and double plain tile cresting, both set in and jointed with Parker's cement; and each flue is to have a second sized chimney-pot set over the same with plain tile flanching in Parker's cement and Thames sand mixed together in equal measures.

:ronts.

1728. To build to the house a new front next and a new front next as shown by the drawings, faced externally with the best second malm stocks of an uniform colour, jointed in the neatest possible manner, and with ganged arches 12 ins. high, accurately cut, and set close at all the openings and blank recesses; the parapets are to be finished and set over in the manner shown by the drawings with two brick fascias 18 ins. wide each.

1729. To provide and put in the brickwork 2 cwt. of wrought-iron ties and hooping to secure the circular corner and the other parts of the house.

g.

1730. To bed and point with mortar all the plates, bond-timber, wood-bricks, stone-work, and other things in or about the buildings which may so require, and to bed and point in lime and hair mortar all the window-frames.

g, &c.

1731. To rake out and point with blue mortar the two back walls as low as the roofs over the low buildings.

Bricks.

1735. All the bricks to be used in or about every part of the work are to be new improved, hard-burnt, square, grey stock-bricks of the best quality, except the bricks of the external facings of the front and back of the house, and except also such portion of the old bricks to be taken down from the present work as the surveyor may approve of.

Mortar.

1736. The whole of the new brickwork (except where hereinafter otherwise directed) is to be laid in and is to be flushed up at every joint solidly with mortar compounded in the proportion of one part in measure of the best Dorking stone-lime, and two-thirds of a part in measure of sharp Thames sand properly beaten together.

Bricklayer's work to be executed.

1736a. No 5 courses of brickwork are to rise more than one foot in advance of the height of bricks. All the walls are to be uniformly carried up in Flemish bond throughout their entire thickness with all the heading-bricks both of the malm and grey stock-bricks carried through in order to prevent excuse for the bad union of two different kinds of bond; all the external joints are to be neatly struck and drawn. (See §§ 353—365, and 1010.)

Rubbish.

1736. To clear away from time to time during the progress of the works all rubbish and useless materials of every kind, and finally to leave the house and premises clear therefrom.

Taking up and relaying pavement.

1736. To clear out the cellars, and relay and make good with sound old bricks all the broken and otherwise defective parts of the paving thereof.

Half a rod of brickwork extra.

1737. To provide and execute under the contract half a rod superficial of the best stock brickwork in addition to the brickwork fully requisite to complete the premises, which extra brickwork is to be used in such further work as the surveyor may direct; the value of such part thereof as may not be required is however to be deducted from the amount of the consideration of the contract, after the rate of per rod reduced , and all further additional brickwork which the surveyor may direct is to be performed at the like price of per rod reduced.

Repair adjoining roofs.

1738. To make good the roofs of the adjoining premises so as to suit the intended alterations.

MASON. (See §§ 265—295.)

Granite templets.

1739. To provide and bed beneath the ends of the new girders of the ground-flooring, eight pieces of old granite curb each 3 ft. long.

Granite sill to shop front.

1740. To put all along at the foot of the shop-front (except at the cellar entrance) a sill of new square parallel granite curb 12 ins. by 8 ins. close jointed, fine-worked, plugged with copper, and run with lead.

Coping.

1741. To re-work the joints and re-work and throat the back and front edges of 25 ft. run of the best of the present Portland stone coping of the parapets; and to provide new similar

Portland stone coping sufficient for completing the covering of the parapets of the fronts next and next .

r-sills. 1742. To put to the new back windows two of the old stone sills; to put to all the windows and blank window recesses in the two new brick fronts, sunk weathered and throated sills of Portland stone 8 ins. by 3½ ins.

y-pieces. 1743. To put to the fire-places of the attic-story 1¼-in. Portland stone jambs mantles and shelves, each 5 ins. wide, 1¼-in. Portland stone slab 1 ft. 6 ins. wide, and Yorkshire stone back hearth.

To repair and reset the chimney-piece of the two-pair west room, and to put a new 1½-in. Portland stone slab, and a Yorkshire stone back hearth to the same fire-place.

To clean the marble chimney-piece of the one-pair west room.

To repair and refix the chimney-pieces of the small south rooms on the one-pair story and the ground-story.

paving. 1744. To defray all expense attendant upon making good to the satisfaction of the proper officer, the public pavings affected by the execution of the works.

&c. 1745. To cut all requisite holes and notchings, and to perform all the other usual work requiring the hand of a mason.

SLATER.

If any slating, see §§ 542—3 and Index.)

CARPENTER and JOINER (see § 337—40).

ng and g. 1746. To erect and main sufficient hoarding for inclosing the house during the carrying on of the works, and to remove and take away the same when so directed.

1747. To shore up in a judicious, safe, and workmanlike manner, the several floors and other parts of the premises so requiring from the nature of the intended works; and to shore up in like manner all adjoining premises.

als. 1748. To provide all requisite materials for, and to frame and fix all carpenter's work and joiner's work of every kind (with all proper ironmongery of the very best quality complete) which may be requisite for carrying into effect and for completing the building and works according to the drawings and this specification, and to render the premises complete and perfect. None of the old materials are to be used again except the same be sound in the opinion of the surveyor, and suitable for the work. All deficiency in the materials is to be made up by new timber and deal. All the requisite oak timber is to be of English growth; all the other timber is to be either Dantzic, Riga, or Memel yellow fir. All the floors and joiner's work are to be of the best Christiana deal, except where herein otherwise directed. All the timbers and deal are to be cut out square and perfectly free from the least sap-wood

in any part, and from shakes, large knots, and all other defects. None of the quarters or joists are to be respectively more than 12 ins. apart.

Centering.

1749. To provide, fix, ease when so directed, and finally remove, all the centering and turning-pieces which may be requisite for the arches of every kind.

Sundries.

1750. To provide and fix 2 cwt of wrought-iron in such ties, bolts, straps, and other works, as may be by the surveyor directed, in order to secure the floors, roof, and other parts of the works. (See ¦ 1277.)

1751. To provide and fix all requisite templets, blocks, stops, linings, casings, fillets, springing-fillets, beads, angle-staves, grounds, backings, furrings, cappings, and other fittings and finishings necessary usual and appropriate to carpenter's work and joiner's work; and to perform all needful grooving, rebating, tonguing, framing, mitring, housing, beading, and other labour and workmanship proper and necessary to wood-work.

Floor of ground story.

1752. To put to the ground-story a new timber-floor as shown by the plan of the basement-story, at the same level as the floor of the small southern room, with joists 7 ins. by 2½ ins., corked and housed upon one plate 4 ins. by 4 ins., two fir girders 13 ins. by 9 ins., and one fir girder 13 ins. by 6 ins., with 12-in. wall-hold at each end: each end of each girder is to be boxed up over the part thereof set in the wall with a cast-iron socket weight 40 lbs. in order to prevent saturation to the timber from the ground.

To lay the whole of the shop with new 1¼-inch yellow deal, wrought floor listed free from sap-wood, and rebated and filleted; to relay and make good all the other flooring-boards and finishings and works disturbed by putting in the new timber floor.

Floor of new attic.

1753. To take off the present roof and ceiling-floor over the two-pair story of the house, and to put a new wall-plate 4 ins. by 4 ins. with an angle-tie 7 ft. long, scantling 6 ins. by 3 ins. at the external corner, joists 10 ins. by 2 ins., trimmers 10 ins. by 2½ ins. and one tier of herring-bone struts; and to lay the whole of the attic-story with inch white deal half-boards.

Other floors

1754. To raise up level as far as practicable when the old front walls are taken down, all the other floors; to put in the new brick-work new fir plates and angle-ties as described to the attic story; to make good all the unsound timbers then discovered, and to relay and make good to the new brick-work with the requisite new materials all the boarded floors of every kind.

1755. To put 50 feet superficial of new inch deal floor to the two-pair story and one-pair story in addition to that requisite against the new brick-work; and to repair in a workmanlike manner all the other parts of the floors throughout the house.

Bond-timber and wood bricks.

1756. To put all round in the brick-work of the new attic-story two tiers of fir bond timber scantling 4 ins. by 2½ ins.; and to put in the brick-work all wood-bricks requisite for fixing the finishings and other works in need thereof.

[redacted]

[APTER IX.

cts.

1757. To put over the window of the small attic a fir lintel 6 ins. by 9 ins.; to put over each of the other windows in the new brick-work a fir lintel 4 ins. by 9 ins. (See § 1041.)

over the story, &c.

1758. To construct the flat over the attic-story according to the drawings, with wall-plate 5 ins. by 4 ins. angle-ties, each 5 ft. long, 5 ins. by 2½ ins. one pair of gutter-plates, each of the pair 12 ins. by 6 ins., one pair of gutter-plates, each of the pair 12 ins. by 2½ ins., and joists average scantling 12 ins. by 2 ins., but cut out of the solid so as to have a current of 1½ ins. in 10 ft.

1759. To frame between the gutter-plates bearers to a current 1½ ins. in 10 feet, and lay the same with inch yellow deal; and to lay the flat with inch yellow deal listed free from sap-wood.

1760. To form in the roof a dormer 3 ft. 6 ins. high, with frame-work inch yellow deal boarding with proper lodged trap-door and outer door, hinges, fastenings, linings, step-ladder, and all other fittings complete.

1761. To alter, make good, and adapt to the circumstances of the case as may be requisite the gutters and roofs to the adjoining premises.

rtered-partis.

1762. To construct the quartered-partitions of the attic-story as shown by the drawings, with plates 4 ins. by 4. ins, end-posts, door-posts door-heads braces king-posts and queen-posts 4 ins. by 3½ ins., quarters 4 ins. by 2 ins., and inter-ties 2½ ins. by 1¼ in. (See 544—50 and 1050—52.)

1763. The principal quartered-partition is to have a wrought iron tie 2 ins. by ½ in. the whole length along the bottom plate thereof, with a corking 12 ins. long let through the whole thickness of the brickwork at each end of the same.

P FRONT. "Boat-ging" see 84.)

1764. Breast-summers 12 ins. by 13 ins.; 4 story-posts jointed in lead at the top 12 ins. by 4½ ins.; 4 cast-iron socket-bases, 6 ins. high for ditto, weight each 20 lbs. Breast-summer to extend along the whole length of the side of the shop next , and to be framed at the external angle of the house to the other breast-summer, but to remain hidden in the brick-work 13 ins. by 10 ins. wrought-iron straps and bolts for securing the breast-summers weight 112 lbs., 2-in. stall-board 12 ins. wide, 2-in. deal lamb's tongue sashes, half one sash to be hung with lines and weights, 1¼-in. two panel bead-flush and square shutters with rebated wrought-iron shoes, proper bars hasps pins and other secure fastenings complete; inch Honduras mahogany fascia to show 18 ins. wide, with cradling complete; moulded cornice with cast-iron enrichment; 1¼-in. deal pilasters with moulded capitals; moulded impost at the stall-board; inch deal tongued and beaded casings to the breast-summer and story-posts; all requisite stops and other fittings; and the present folding-doors and the cellar-door to be repaired and re-hung in proper fir frames 5 ins. by 4 ins.

1765. To put over the folding-doors a panel of open iron-work as shown by the elevation.

1766. To complete the lining of the shop with ¾-in. deal matched and beaded, and fixed with the requisite backings.

Areas, &c.

1767. To repair and alter according to the drawings the situations of the cellar-flap and area-grating with the frames thereto.

Windows.

1768. To put to the attic story 1½-in. ovolo sashes, double hung with large patent lines, iron weights, and iron axle-pulleys and patent spring-fastenings in deal cased-frames with oak sunk sills; and to put to each of the attic windows inch tongued beaded and quirked linings and window-boards.

To put to the two-pair story one new window as described for the attic story.

1769. To repair thoroughly all the remainder of the sashes and frames throughout the premises; to re-hang the whole thereof, with new large patent lines, and the requisite new pulleys, fastenings, and other proper work and fittings.

1770. To repair thoroughly, adapt, re-fix, and make good, all the shutters, linings and other fittings of the windows affected by the alterations and new work.

New doors, &c.

1771. To put to the whole of the attic story, new 1½-in. square framed four-panel doors hung complete with 3-in. butt-hinges and good 6-in. iron rimmed locks with plain brass furniture, in 1¼-in. single-rebated linings with ogee moulding to form an architrave all round on both sides of each door.

Skirting.

1772. To skirt the whole of the new attic-story with ¾-in. square skirting 6½ ins. high plugged to the walls.

Stair case.

1773. To take down the present attic stair-case, and erect in lieu thereof a new stair-case according to the drawings, with inch yellow deal treads risers and landings on strong bracketed fir carriages, 1¼-in. wall-string and outer strings, deal moulded hand-rail, square bar balusters, all requisite apron and other linings of inch deal, and all requisite other fittings of every kind.

1774. To batten with inch yellow deal for plastering the walls of the two-pair story of the stair-case.

Entrance passage, &c. &c.

1775. To board the North-west side of the entrance-passage with inch rebated and beaded linings 5 ft. high, with beaded capping on the top thereof; and to put outside the door a mitred architrave, inch yellow deal tongued side linings, and other fittings as shown by the drawings.

General repairs.

1776. To repair and re-hang the closet folding-doors of the two-pair West room, and to repair the linings of the entrance-door of the same room.

1777. To repair the defective panels of the wainscotting over

the one-pair West-room fire-place; and to repair and re-hang the doors of the closet on the one-pair landing of the staircase.

1778. To repair thoroughly, ease, re-fix, and where requisite re-hang with new hinges and the other proper work, the doors and shutters of every kind throughout the premises.

1779. To carefully examine the whole of the internal and external wood-work of the entire dwelling-house, and wherever there is any decay, unsoundness, or other defect therein, to repair remedy and make good all such decay unsoundness or other defects in the most secure neat and workmanlike manner.

1780. To prepare all the work of every kind for the painters; to secure all loose skirtings, linings, and other finishings.

tement gs to the nts.

1781. To reinstate, adapt, make perfect, and complete all the wainscoting, cornices, and other wood-work and fittings of every kind which will be disturbed, injured, affected, or in any way of necessity altered by reason of the rebuilding of the two new fronts to the house, and by reason of the performances of the works.

ıgery.

1782. To take off the whole of the locks and other fastenings of every kind throughout the house; to clean, repair in the most perfect manner, and re-fix such thereof as will turn out to be worth the same, and to reinstate by new ironmongery of the best quality all deficiency in the present ironmongery. To fit to the locks, new keys wherever the old keys are lost or are imperfect.

1783. To take off, repair, laquer, and re-fix all the sound brass-work of every kind throughout the house, and to provide and fix new plain brass-work of the very best quality for all deficiencies in the old brass-work, and for every other part of the premises requiring brass furniture.

ıbe fir

1784. To provide and fix under the contract 25 ft. cube of fir timber in addition to the materials requisite for completing the premises, to be used as joists, rafters, or quarters, in such further work as the Surveyor may direct, the value of such part thereof as may not be ordered by the said Surveyor to be used is however to be deducted from the amount of the consideration of the contract, after the rate of per foot cube, and to provide and fix at the like price of per cubic foot all such further additional timber in joists, rafters, or quarters, as the Surveyor shall direct to be used.

PLASTERER.

W. ceil-

1785. To lath, plaster, and set the ceilings and the strings of the stairs of the whole of the attic-story and of the two-pair story, and all the quartered-partitions and the sides of the stair-case at the two-pair story.

ing.

1786. To render and set the whole of the brick-work of the attic story and of the large closet of the two-pair story.

L. P. F. S. & W. ceilings. 1787. To put to the strings of the old staircase, and to put to the large room on the one-pair story new lathed plastered floated and set ceilings.

W. & S. 1788. To wash, stop, and repair thoroughly all the other plastering of every kind throughout the house.

Whiten and colour. 1789. To whiten all the ceilings and the strings of the stairs throughout the house; and to colour of such teints of stone-colour as may be directed all the other plastering of the house.

PLUMBER.

6 lb. milled-lead flat and gutters. 1790. To lay the whole of the roof and gutters over the attic-story with milled-lead weight 6 lbs. to the foot superficial, joined with rolls as shown by the plan, and turned up 5 ins. high all round next the brick-work.

4 lb. milled-lead flashings. 1791. To put in the brick-work all round the flat 4 lb. milled-lead flashings 5 ins. wide.

5 lb. milled-lead [illegible] 1792. To cover the dormer all over with 5 lb. milled-lead, properly secured and dotted, and to cover the shop-front with similar lead 10 ins. wide, with a flashing as to the flat.

[illegible] rain-water pipes, &c. 1793. To put from the upper roof to the flat over the low building a complete stack of 4½-in. cast-iron rain-water pipe, fixed with shoe and long lead head to receive the water from the two gutters.

Adjoining gutters, &c. 1794. To relay and make good as far as may be requisite on account of the intended works the adjoining gutters of the house in and of the house in ; and to put a branch pipe to convey the water from the adjoining lower roof into the other pipe.

PAINTER.

Preparations. 1795. To knot, stop, prepare properly, pumice smooth in every part thereof, burn off where requisite, and bring to an uniform surface, all the works intended to be painted.

Twice, &c. in oil. 1796. To bring forward with the requisite number of coats of colour, and paint in the best manner twice with the best oil-colour, the whole of the old works usually painted, and those works which have been altered or repaired both of the inside and of the outside of the premises.

Four times in oil. 1797. To paint four times with the best oil-colour all the new wood-work, iron-work, and other works usually painted both of the inside and of the outside of the premises.

Graining, colours, &c. &c. 1798. To comb finely and to grain in imitation of wainscot in a superior and artistlike manner of a light colour, and to varnish twice with the best copal varnish the whole of the wood-

work of the large room on the one-pair story and the outside of the entrance door of the same room.

1799. To paint in imitation of real mahogany and to varnish twice with the best copal-varnish the entire hand-rail of the staircase.

1800. To paint all the sashes externally dark purple brown.

1801. To paint all the other parts of the premises of such plain teints of stone-colour or of other colours of equal value as may be directed.

GLAZIER.

Best glass. 1802. To glaze the windows of the shop-front with the very best clear Newcastle crown glass.

2nd glass. 1803. To glaze all the other new sashes and lights of every kind with good second Newcastle crown glass.

Repairs. 1804. To cut out and make good all the squares of glass of the whole house which have more than one single crack therein.

Repair old putty. 1805. The whole of the old glazing is to be puttied where requisite.

Clean, &c. glass. 1806. The whole of the new glazing is to be properly bedded, bradded, and back-puttied; and all the glazing is to be cleaned and left perfect at the rendering up of the premises as complete.

Old glass may be used. 1807. Any of the old glass may be used again as far as applicable to the purposes of the work.

CHAPTER X.

SPECIFICATION *for works to be done at the premises No. , for , in ALTERING, STUCCOING, and DECORATING the PRINCIPAL FRONT of the said premises, and in other repairs to the said premises.*

BRICKLAYER, MASON, &c.

Notices and fees. 1808. To give to the District-surveyor, the surveyor of pavements, and all other public officers the requisite notices, and to pay to them their respective fees.

Rubbish. 1809. To clear away from the premises from time to time all rubbish which may accrue thereon from all the various works intended to be performed, and to leave finally the same clear therefrom.

Tiling. 1810. To repair thoroughly all the tiling of the several roofs of the premises (more particularly of and of) providing the requisite new tiles and heart of fir double laths, and putting pegs wherever they can be admitted; to re-set all the ridge-tiles and hip-tiles in lime and hair, and to secure the whole thereof with T nails, dipped in melted pitch.

Slating. 1811. To examine all the slating where the same shall be found defective; to repair the same thoroughly, using the requisite new slates and copper nails for the whole of the work.

Clean gutters and leave roofs perfect. 1812. To clean out all the gutters, and to leave finally at the rendering up of the whole premises as complete the whole of the roofs perfect and the whole of the gutters clean.

Settlements. 1813. To cut out the brickwork at all the settlements therein to the dwelling-house, workshops, and ; and to bond into the brickwork new stock-bricks with Parker's cement and Thames sand mixed together in equal measures, so as to repair the same in a secure manner.

Copings, strings, &c. 1814. To take down and re-build with sound new stock-bricks the defective parts of the parapets; to re-set in Parker's cement and Thames sand mixed together in equal measures, the brick-on-edge and other copings; to repair the string-courses where defective, and to point the tops of all the string-courses with Parker's cement and Thames sand mixed as last described.

Repairs, pointing, &c. 1815. To rake out the joints at least ¾ in. deep; to cut out the defective bricks, to repair with new stock-bricks, and to point in a neat and workmanlike manner with Dorking stone-lime coloured mortar all the external brickwork of where in any way decayed, the whole of the fence-walls of the adjoining yard, also the East side of the building on the West side of the yard for 3 ft. down from the top of the parapet thereof and wherever else may be requisite.

Buildings, &c. round front yard, &c. 1816. To repair and point in like manner the whole of the brickwork of the North and East sides of the front yard, the fence-wall on the West side thereof, and where requisite to the brickwork of the workshops on the South side of the yard.

Chimney-shafts, parapets, party-walls, &c. 1817. To repair and point in like manner where requisite the chimney-shafts, the insides of the parapets, and all the other brickwork in about or connected with the roofs.

Lime-whiting. 1818. To lime-whiten twice the whole of the ceilings internal walls and the other parts before whited of the buildings on the East and South sides of the front yard.

Front next— 1819. To erect a scaffolding to the whole of the front for the use of the bricklayers and plasterers.

1820. To take down the brick-work of the principal front as low as the level of the bottom of the fascia under the intended cornice, to rebuild the brickwork (providing the requisite new

hard burnt stock-bricks) in the form proper for receiving the intended stucco-work according to the elevation, and with one course of 3-in. Yorkshire stone 16 ins. wide set therein for the projection of the cornice.

1821. To prepare the whole of the remainder of the front in order to receive the intended stucco-work, by raking out the mortar from the joints thereof, by cutting away some portions and by adding to the other parts thereof tiles nailed securely to the old brick-work, so as thereby to render the various parts of the front as level straight and uniform as possible: for the cornices over the one-pair windows a course of bricks is to be inserted in the old wall so as to afford the proper projection for the stucco-work.

1822. The whole of the new brick-work and all the extra projections are to be set in Parker's cement and clean Thames sand mixed together in equal measures.

1823. To cut out and bond into a toothing in the adjoining house and joint and make good also with Parker's cement the brick-work at each end of the front of the house, where the same is at present disunited from the adjoining work.

-work. 1824. To make good the public paving to the satisfaction of the commissioners of paving, leaving the area-gratings 2 ft. wide from the front; and to put round the gratings curbs re-worked and formed of the stone curbs at present under the shop-front, jointed with lead; to put to the doorway a new step of Portland stone 5 ins. deep 10 ins. wide and 5 ft. 3 ins. long, the part of the paving under the windows is to be raised with new 4 in. Yorkshire stone wrought with fair edges to form a plinth.

CARPENTER, SMITH, &c.

building. 1825. To repair and make complete all the sashes and window-frames, and to put thereto the requisite new sash-lines of large patent cord.

1826. To put to the roof new 4 in. cast-iron eaves'-guttering fixed on iron brackets and 3 in. cast-iron rain-water-pipes with heads and shoes complete.

1827. To put under the front gutter-plate two fir-posts scantling 6 ins. by 4 ins. reaching two stories each, and to wedge up
LING- the said gutter-plate as nearly as possible to a level.
E.

ky-light. 1828. To put over the staircase a new 2½-in. ovolo sky-light glazed complete with second Newcastle glass; to repair the bulk round the skylight with at least 30 ft. superficial of new yellow deal weather-boarding; and to put to the skylight all requisite linings of inch yellow deal and other proper fittings.

r. 1829. To repair thoroughly the dormer and to put thereto new inch yellow deal cheeks and a new inch yellow deal wrought

tongued and ledged door hung complete with a pair of strong cross-garnet hinges and a bolt.

Window.

1830. To take out the back window on the three-pair story, to put thereto a new sash-frame, to repair and rehang both the sashes with large patent lines, and to make good all the finishings thereto.

Battening to 3 pair story.

1831. To batten out with 2 in. deal the party-wall in the North-West room and in the lobby adjoining thereto on the three-pair story; and to make good the skirtings and other wood-work to the party-wall.

One pair floor.

1832. To take up the flooring-boards in the front room on the one-pair story all along next the Eastern party-wall and for 4 ft. in width; to cut away the joists down one inch deep; to relay and make good the floor thereto more level, and put along that side of the room an additional skirting of $\frac{3}{4}$ in. deal.

Fir ceiling beneath.

1833. To fir down to a level as nearly as possible the two front compartments of the shop-ceiling.

FRONT.

Upper story.

1834. To put in the new brick-work of the upper story two tiers of fir bond-timber 4 ins. by $2\frac{1}{2}$ ins.; to provide and fix 10ft. cube of fir in plates and other work connected with the roof; to make good the skirtings and to perform all other work and labour which may be requisite for completing to the new brick-work, the fittings, and finishings of the same story.

Windows.

1835. To fir out the window-frames with blocks to receive laths for forming the external architraves, and to make to the windows, such additions and alterations, as will be requisite for rendering the same as uniform, level, and perpendicular as possible.

Shop front, &c.

1836. To take down the present shop-front, to put a new wrought fir story-post at the west end of the front; to remove the two door-posts, to put in lieu of the story-posts two cast-iron columns 5 ins. diameter at bottom and $4\frac{1}{2}$ ins. diameter with caps and bases; to fir and case the breast-summer with inch yellow deal tongued and beaded; and to construct and fix a new shop-front according to the drawings, with 2-in. lamb's tongue sashes and fan-light, glazed with the best Newcastle glass, $1\frac{1}{4}$ in. moulded and bead-butt shutters with sunk shutter-lifts rebated wrought-iron corner-shoes, thumb-screws and plates, dogs at the tops of the shutters, wrought-iron top-rails $1\frac{1}{4}$ in. by $\frac{3}{4}$ in. to receive the dogs, strong wrought-iron bars with plates, hasps, sockets, pins, and spring-keys complete. A panel of cast-iron open-work, according to the drawings, to be let in at the top of each shutter. To fill in outside the stall-board with wrought-iron bars one inch square, not more than 4 ins. apart, let at top and bottom into wrought-iron rails $1\frac{1}{2}$ in. by $\frac{3}{4}$ in. and deal moulded fascias and small pilasters, as shown by the drawings.

1837. To provide and hang in the shop-front a 2-in. deal moulded and bead-flush sashed door with $1\frac{1}{4}$-in. bead-flush and bead-butt shutter with iron-work as to the other shutters (the

bars excepted) the door glazed as the sashes and hung with ironmongery value 30*s*.

1838. Entablature to the shop-front according to the drawings, with inch Honduras mahogany frieze, inch deal cover-board 1¼ in. bracketing, composition (*or cast-iron*) enriched crown moulding, 1¼ in. plain mitred and returned pilasters with one composition (*or cast-iron*) enrichment in the capitals thereof.

1839. To provide and fix all linings, blocks, cradlings, and grounds requisite in order to complete the shop-front.

Shoring, hoarding, &c.

1840. To perform all shoring and strutting; and to provide also all hoarding and other protection for the safety of passengers which by the proper authorities may be required.

Shop-fittings.

1841. To take down, alter, refix and make complete, such parts of the glass-cases and other shop-fittings as will be damaged or affected by the repairs and alterations; to case over with inch deal the stall-boards to the extent shown by the plan.

Area-gratings.

1842. To put two new cast-iron area-gratings to project two feet from the front of the house with bars 1¼ in. by ¾ in., not more than 1½ in. apart, and frames and fangs 1¼ in. square. (See § 1333.)

PLASTERER.

Take down ( ) ceiling.

1843. To take down the whole of the upper ceiling of and remove the old lath-nails thereof.

New ceiling to shop.

1844. To put to the two front compartments of the shop, new ceilings lathed plastered floated set and whited.

Front of the house.

1845. To execute in the very best manner the whole of the external front of the house next in Parker's cement stucco according to the drawings, with all the mouldings fascias projections and decorations therein represented; the whole to be floated out as accurately as possible, to be roughly coloured in small portions as soon as done, and while yet soft to be jointed very strongly, and finally when directed by the surveyor, to be teinted in imitation of stone, with weather-proof outside-colouring mixed with beer-grounds, Russia tallow, tar, and the other proper ingredients; to perform all requisite dubbing out, and to lath where requisite the window-frames for the formation of the architraves. (See § 303.)

PLUMBER.

Gutters, &c.

1846. To examine and where requisite repair thoroughly the gutters and other lead-work of the roofs of the premises.

Dormer and sky-light.

1847. To cover the sides of the front dormer with 5 lb. milled-lead turned down over the roof at least 10 ins., and to put round the new sky-lights, flashings of similar lead 15 ins. wide.

Shop-front.

1848. To cover the top of the new shop-front with 6 lb. milled-lead turned up 6 ins. against the brick-work, and with a flashing of 4 lb. milled-lead 6 ins. wide let into the brick-work and turned down over the same.

PAINTER.

1849. To bring forward with two or more extra coats of colour all the new or altered or damaged works; to stop, pumice, and otherwise prepare properly, and paint twice with the best oil-colour, all the new works of every kind which usually are painted, all the external old works usually painted, and the two front-rooms and the lobby on the three-pair story; the sashes of the front of the house are to be finished dark purple-brown, the shop-front and the sashes shutters and door thereof are to be finely combed and finished in the very best manner entirely in imitation of light oak, and are to be twice varnished with very strong copal.

GLAZIER.

1850. To repair all the windows of the workshop-buildings with strong knob-squares; to cut out and make good all the other broken squares of glass throughout the dwelling-house having more than one crack therein: and to clean all the windows, and finally leave at the rendering up of the premises the whole of the glass clean and perfect.

PAPER-HANGER.

1851. To canvass and under-line with strong elephant paper the party-wall, the north-west room, and the adjoining lobby, all on the three-pair story; and to paper the whole of the same room, the lobby, and the room adjoining east thereto, with figured paper value 4*d.* per yard, cut close.

CHAPTER XI.

SPECIFICATION *of works to be done to the house and premises No.* , *belonging to* , *in* REBUILDING THE REAR FRONT *of the said house, and in the* GENERAL REPARATION *of the said house and premises.*

BRICKLAYER.

Notices, licenses, &c.

1852. To give the requisite notices to the District-surveyor, to the Surveyor of Pavements, and to the Commissioners of Sewers and other official persons concerned in the work; to obtain from them all the necessary licenses, and to pay to the whole of them their proper official fees and charges of every kind.

[redacted]

HAPTER XI.

build chimney-afts.

1853. To take down the chimney-shafts as low as the roof, and below the roof as far down as defective; and to rebuild the chimney-shafts of new sound stock-bricks with flues of the same size as the present flues, properly pargeted inside; to finish each shaft with salient-courses 6 ins. high and double plain-tile cresting, both set in and jointed with good quick Parker's cement and clean Thames sand mixed together in equal measures; and to put over each flue a new first-sized chimney-pot set in tiles, Parker's cement, and sand the same as the tile cresting.

w front chim-r-stack.

1854. To take down carefully the whole of the front stack of chimneys from the foundation upwards; to cut and parget perpendicular chasings in the brick-work of the party-wall as far as practicable; to rebuild with sound new hard-burnt grey stock-bricks the whole of the same chimney-stack with as little projection as possible, the kitchen chimney-opening 5 ft. wide, 1 ft. 1½-in. deep, and with jambs 18 ins. wide, the attic fire-place 18 ins. wide, and the several other fire-places of convenient widths; to properly turn, parget, and core all the new flues; to put to the kitchen fire-place a wrought-iron chimney-bar 3½ ins. by ¾-in.; to put to each of the other fire-places a wrought-iron chimney-bar 2½ ins. by ½-in.; to secure the intended new chimney-stack to the old party-wall by at least 160 lbs. avoirdupoise of wrought-iron ties; to put for the support of the slab of the intended kitchen fire-place a 4-in. brick fender 12 ins. high; and to put to each of the other fire-places a 4-in. brick trimmer 12 ins. longer than the chimney-opening.

build front apet.

1855. To take down to the depth of 3 ft. the parapet of the fore-front of the dwelling-house, and rebuild the same in a workmanlike manner with new stock-bricks faced with bricks to match the bricks of the remainder of the front.

e-front.

1856. To take down the basement-story of the front wall of the dwelling-house as far as the same is sunk, fractured, or otherwise defective, and to rebuild and make good the same as shown by the drawings, with sound new hard-burnt grey stock-bricks of the best quality set in the best new quick Parker's cement and clean Thames sand mixed together in equal measures; to take out all the fractured and defective arches of the fore-front, and to make good the same in a neat and workmanlike manner with the requisite portions of new gauged-work to match the present gauged-work; to cut out and make good in like manner the brick-work to all the other settlements and defects in this front, particularly by the front door; and to rake out and point in the neatest manner (with coloured mortar to match) all the joints of the same front, and to stain and make the whole front appear as uniform as possible; and when the new work thereto is dry, to tuck-point in the neatest possible manner the whole of the same front.

k-front.

1857. To alter and enlarge the window-opening of the intended scullery on the basement-story, and make good the brick-work thereto in the manner described for the other windows of the basement, and to repair thoroughly all the brick-work of the basement-story of the back-front.

PART II.

[redacted] the whole of the back-front of the dwelling-[redacted] the paving of the yard, and to rebuild the [redacted] according to the Building-act with new [redacted] stock-bricks.

[redacted] the mortar from all the joints of the whole [redacted] to cut out all the broken and [redacted] and make good thereto with [redacted] point entirely with Dorking [redacted] the same walls.

[redacted] the area-walls so far as shown by [redacted] to take out the mortar [redacted] of the walls, and to repair, com- [redacted] the sides of the areas.

[redacted] the basement-walls [redacted] to repair, under- [redacted] new grey stock-bricks set [redacted] and clear. Thames sand mixed [redacted] to make good in like manner the [redacted] to rake out and point [redacted] the brick-work of the [redacted] defective.

[redacted] the new frames intended to [redacted] make good in a sound [redacted] all the windows.

[redacted] new laths of the double laths [redacted] the present [redacted] and providing new [redacted] and to fillet the [redacted] strong cast-iron nails [redacted] secure the filleting.

[redacted] and point where requisite the [redacted] of the out-buildings.

[redacted] repair thoroughly in a complete [redacted] the cesspools, drains, and water- [redacted] to the premises, renewing such [redacted] as may turn out so far defective [redacted] to restore and make good the [redacted] which will be removed or affected [redacted] drains, and water-courses; and [redacted] to perform such additional improve- [redacted] the premises to the full value of 5*l.* as [redacted] directed.

Paving yard.

1866. To prepare properly the ground, and to pave with hard-burnt new grey stock-bricks laid flat in mortar and grouted between the joints with liquid mortar, the whole of the flooring of the two large closets under and adjoining to the basement-stairs, and the whole of the lower story of the workshops.

Excavations for *piers under* the

1867. To dig out and remove the ground to the depth of

[redacted]

APTER XI.

ment floor- 4 ins. below the under side of the intended new Yorkshire stone paving in the basement-story, and to dig out and remove the ground to the depth of 6 ins. beneath the sleepers of the intended boarded-flooring of the kitchen, and to build for the support of the sleepers of the same floor brick piers 9 ins. square, 9 ins. high, and not more than 3 ft. apart.

bish, &c. 1868. To remove and cart away from the premises from time to time as occasion may require, all soil, and all the old bricks, tiles, rubbish, and useless materials; and to leave finally the house and premises entirely free therefrom.

tar. §§ 1008—10). 1869. All the mortar to be used in the bricklayer's work is to be composed of one third by measure of the best Dorking stone-lime and two thirds by measure of clean Thames sand, properly beaten and worked up together.

ing-work. (See § 1011.)

MASON. (See §§ 265—295.)

ings. 1870. To cover the back parapet of the dwelling-house with the coping at present on the front parapet thereof, re-worked, re-jointed, made good with sufficient new stone to correspond therewith, bedded in mortar, and jointed and run with lead.

1871. To cover the front parapet of the dwelling-house with new Portland stone coping 13 ins. wide, 4 ins. thick in front, 2 ins. thick at the back, throated behind, and plugged with lead at all the joints therein.

tland stone s. 1872. To put to all the front windows of the dwelling-house new Portland stone weathered, sunk and throated sills, scantling 5 ins. by 9 ins.

kshire stone s. 1873. To put to all the back windows of the dwelling-house new sills of 3-in. Yorkshire paving-stone 9 ins. wide, fairly tooled, throated, and laid sloping.

tland stone b to area, &c. 1874. To put round the front area, a new curb of Portland stone, 5 ins. by 5 ins. rubbed fairly all over, and cut out to receive the intended new iron-railing; and to take up the paving of the front entrance doorway, and put in lieu thereof new 3-in. Yorkshire stone landing in not more than 2 stones.

arths and bs. 1875. To take away from the chimneys all the broken hearths, slabs, and foot-paces thereof, and reinstate the same by new hearths of 2-in. rubbed Yorkshire stone, and new slabs of 2-in. Portland stone not less than 16 ins. wide; and to repair with the requisite new stone-work, and refix where necessary the several back chimney-pieces of the premises.

imney-pieces. 1876. To put to the intended new kitchen and to the intended new scullery, chimney-pieces consisting of jambs mantles and shelves each of 2 in. Portland stone 8 ins. wide; to put to the front room on the one-pair story a neat boxed Portland stone chimney-piece; and to put to each of the other fire-places of the

[illegible] new front chimney-stack 1¼ in. Portland stone jamb mantles and stones each 5½ ins. wide; and to make good the [illegible] and sides to the said chimneys.

Area. 1877. To put in the basement-story of the dwelling-house a Yorkshire stone sink 7 ins. thick containing 10 ft. superficial, properly fixed with the requisite bearers and cut out to receive the pipe and grating; and to provide and fix in the paving two five-inch stone slabs.

1878. To take up, repair, and relay in regular courses, the pavement of the yard, putting thereto at least 20ft. superficial of new [illegible] Yorkshire stone paving.

Paving. 1879. To pave with the best 2½-in. Yorkshire stone close-jointed and laid in regular courses on 4-in. brick cross walls, 6 ins. high, the whole of the basement-story except over the boarded floor of the kitchen and the brick-paving of the two closets by the stair-case.

SLATER. (See §§ 542—3.)

1880. To slate the whole of the roof of the dwelling-house (when altered as directed in this specification) with the very best strong countess slates securely fixed with copper nails, pointed on the inside with stone-lime mortar with sufficient hair therein, and with proper bond in every part of the slating, more particularly at the eaves and at the ridges, having cut slates instead of as in the usual manner slates laid lengthwise, with narrow slips of slate laid between them.

1881. To make good to the satisfaction of the surveyor immediately prior to the rendering up of the premises as completely repaired, all the damage which may have occurred to the slating.

CARPENTER AND JOINER. (See §§ 337—40.)

Roof of the dwelling house. 1882. To examine and repair thoroughly the roof of the dwelling-house, providing and fixing thereto at least 12 cubic feet of the best Baltic yellow fir timber, with the requisite labour, and with nails spikes and all other proper materials.

1883. To alter the northern span of the roof, by hipping the same so as to allow the middle gutter to discharge itself into the back gutter, instead of the water passing through an internal trough as at present.

1884. To cover all the rafters of the roof over the dwelling-house, with inch yellow deal slate-battens 2¼ ins. wide and clear of sap-wood.

Gutters, &c. 1885. To take up all the gutter-boards and bearers of the roof over the dwelling-house, and to put instead thereof entire new gutter-boards of inch yellow deal clear of sap-wood, laid on

strong fir bearers to current 1½ in. to every 10 ft. in length, and with 2½-in. rebated drips for all the joints of the lead; and to put round all the gutters ¾-in. yellow deal lear-boards 10 ins. wide.

Dormer.

1886. To repair thoroughly the dormer, to put new inch yellow deal dormer-cheeks, and to provide and hang a new inch yellow deal ploughed, tongued, and beaded dormer-door, with strong cross-garnet hinges, and a strong bolt.

Bond-timber and plates.

1887. To put in each story of the brick-work above the basement-story of the intended new back-front, and of the intended new front chimney-stack, two tiers of Baltic yellow fir bond-timber scantling 4 ins. by 2½ ins., and to put to each story of the same new brick-work a new Baltic yellow fir wall-plate 4 ins. by 4 ins. (See § 1038.)

Ground-floor, &c. of the dwelling-house.

1888. To take up the whole of the boarded-floor of the ground-story of the dwelling-house, to reframe in a secure and workmanlike manner, and raise up the timbering of the whole of the ground-flooring, to a level at least 2 ins. above the public footway before the house; to take away all the unsound timbers of the present flooring, and to reinstate the same by new timbers of Baltic yellow fir of sufficient scantling; to provide and fix to the ground-flooring all requisite furrings; to use in repairing the other floors of the dwelling-house such of the old flooring-boards to be taken up from the ground-floors as will remain sound; and to lay the whole of the ground-story with new 1¼-in. yellow deal clear of sap-wood.

Floors generally.

1889. To repair thoroughly with all requisite labour the whole of the timber and boarded-floors of every kind throughout every part of the premises, providing and applying for the same at least 25 cubic feet of the best Baltic yellow fir, 200 ft. superficial of the best inch yellow Christiana deal flooring-boards and 200 ft. superficial of yellow deal to be used in furring up level the same floorings; and to cut away for and make good the floors to the intended new slabs of the fire-places.

New kitchen floor.

1890. To put to the intended kitchen a floor of 1¼-in. yellow deal listed quite clear from sap-wood, and laid upon Baltic yellow fir joists 2½ ins. by 4 ins., not more than 12 ins. apart, and Baltic yellow fir sleepers 4 ins. by 3 ins., not more than 3 ft. apart, (*or English oak sleepers.*)

Fir ceilings and strings.

1891. To fir down quite level with yellow deal the whole of the timbers which are intended to receive new ceilings and strings throughout every part of the dwelling-house.

New windows.

1892. To put to the whole of the windows throughout the dwelling-house, including the basement-story, new 1½-inch ovolo yellow deal sashes double hung with brass axle-pulleys, the best large patent lines, iron weights and patent spring-fastenings in yellow deal cased-frames with English oak sunk sills.

Shutters, &c.

1893. To put to the front windows on the ground-story new 1¼-in. bead-flush and square-framed shutters hung in two heights with proper boxings, 1¼ in. bead-flush soffit back and elbows, inch

bead-butt back linings, two very strong spring shutter-bars, strong brass shutter-knobs, and all other requisite fittings complete.

1894. To put to the back-window of the ground-story a pair of new 1¼-in. yellow deal bead-butt outside shutters hung complete with the requisite side-styles, strong Redmund's hinges, and two strong bolts; to remove from the same window the window-seat, and put thereto a new 1¼ in. square framed window-back, and inch deal tongued and beaded window-linings.

1895. To fit up the windows of the basement-story with inch deal tongued and beaded linings and window-boards, with the requisite backings and bearers.

1896. To fit up and make good to the new frames all the remainder of the window-linings and other appertenances of the windows.

Staircase.

1897. To repair the whole of the stair-case, to raise up the stairs and landings thereof where sunk, and to put new 1¼-in. yellow clean deal treads and landings to the whole of the stair-case, from the basement-floor upwards; and to repair thoroughly and make good and complete the hand-rails, balusters, string-boards, and other works of the stair-case.

General repairs.

1898. To repair thoroughly in a neat and workmanlike manner all the wood-work of every kind throughout the whole of the dwelling-house out-buildings and premises; to repair secure and make good all broken panels; to reinstate and make perfect all the rotted broken and otherwise defective skirtings linings wainscottings and other fittings of every part of the premises; and in general to prepare properly for painting all the internal and external works of every part thereof.

Dwarf wainscotting.

1899. To repair thoroughly the dwarf-wainscotting of the entrance-passage of the dwelling-house, putting thereto entire new bead-flush panels and the other requisite work.

Doors, &c.

1900. To put to the back room on the ground-story a new 1½-in. four-panel square framed door, hung with a pair of 3½-in. butt-hinges; and to reframe level and perpendicular the opening in the partition for the same door, and to put thereto a new moulded architrave on each side thereof.

1901. To repair thoroughly, ease, and rehang with the requisite new hinges, all the doors of every kind belonging to every part of the dwelling-house out-buildings and premises.

Front entrance.

1902. To take down from the front entrance of the dwelling-house the wood dressings thereof; and to put a new four-panel 2 in. moulded and bead-butt door hung with three 4 in. butt-hinges a best 10 in. draw-back lock two 10 in. barrel-bolts a strong barrel-chain and all other requisite fittings; and to put over the door a 2 in. deal moulded fan-light with transom and linings complete.

Basement partitions.

1903. To take down and alter the partitions in the basement-

story as shown by the plan ; and to repair thoroughly and make complete all the remaining partitions, with the requisite sound materials to correspond with the other parts thereof and using for that purpose (so far as the same will go) the materials of the partitions intended to be removed.

Internal and other shoring.

1904. To perform carefully all shoring which will be requisite on account of the rebuilding of the front chimney-stack and the back-front of the house, and all shoring which may be requisite for the proper performance of the several other works.

Ironmongery, &c.

1905. To take off all the remaining ironmongery locks and brass-work, clean repair thoroughly laquer and refix the same, and put new 7 in. iron rimmed locks with plain brass furniture all of the very best quality for all deficiency ; and to provide and fix all other new ironmongery and brass-work of good plain quality which may be requisite for completing in every respect the fastenings and fittings of the whole premises and their appertenances.

Sundries.

1906. To repair thoroughly the case of the cistern.

1907. To put to the privy a new inch yellow deal floor on strong yellow fir bearers and a new inch clean yellow deal seat with riser bearers inch yellow deal clamped flap and frame, and all other requisite fittings complete.

Dresser.

1908. To put in the intended kitchen a dresser with pot-board drawers and shelves complete value *5l.*

Workshops.

1909. To repair thoroughly the wood-work of the workshops, putting thereto at least 12 cubic feet of Baltic yellow fir, 50 ft. superficial of inch yellow deal, and 50 ft. superficial of feather-edged yellow deal weather-boarding ; to repair thoroughly adapt and make complete the sashes and frames and set the same as far as possible upright.

1910. To repair the doors and door-frames, to repair thoroughly and make sound and perfect the steps leading to the upper workshop, to trim properly the floor, and to fix the steps so as to ascend within the building, and to repair the guttering and put thereto new inch yellow deal fronts.

50 cubic feet extra fir timber.

1911. To provide under the contract 50 cubic feet of the best Baltic yellow fir timber, to be used in such rafters joists and quarters as may be by the surveyor directed to be applied in addition to the other fir timber which may be requisite for repairing the dwelling-house out-buildings and premises as described in this specification, the value of such portion of which extra fir timber as may not be directed by the surveyor to be used is however to be deducted from the amount of the consideration of the contract after the rate of per cubic foot, and to provide and fix such further additional fir timber in rafters joists and quarters as the surveyor may direct at the like price of per cubic foot.

SMITH.

New front railing.

1912. To provide and fix entire new palisading all round the front area, consisting of cast-iron bars 1 in. square placed diagonally not more than 4 ins. apart and with heads, according to the drawing, cast-iron top-rail and three standards of cast-iron each 2 ins. square with vases also according to the drawing.

Area-grating.

1913. To provide and fix over the back-area of the dwelling-house a cast-iron grating with frame 1 in. by 1¼-in. and bars ¾ in. by 1¼-in. not more than 1½-in. apart.

R. W. pipes.

1914. To put to the back-front of the dwelling-house a stack of 3 in. cast-iron rain-water-pipe fixed with head and shoe complete.

PLASTERER.

Take down old plastering.

1915. To take down all the old lathing and plastering of every kind throughout the whole of the dwelling-house, except the ceilings of the front attic, the ceilings of the rooms on the two-pair story, and except also the plastering of the walls of the staircase.

New L. P. S. and W.

1916. To put to the back room and closets on the attic story, and to the whole of the basement-story of the dwelling-house, new lathed, plastered, set, and whited ceilings and strings.

New L. P. F. S. and W

1917. To put to the whole of the remainder of the dwelling-house (the rooms on the two-pair story excepted) new lathed, plastered, floated, set, and whited ceilings and strings.

R. S. and colour.

1918. To render, set, and colour the sides of the intended kitchen, the sides of the intended scullery, and the sides of the attic-story.

R. F. S. and colour.

1919. To render, float, set, and colour all the unwainscotted sides of the remainder of the dwelling-house, the sides of the staircase excepted.

Repair W. S. W. and colour.

1920. To repair thoroughly, wash, and stop all the remaining old plastering of the premises, and to whiten the ceilings and colour the sides thereof.

Lime whiting, &c.

1921. To stop thoroughly, and lime-whiten twice, the whole of the unplastered sides of the basement-story and the rough unpainted partitions, and the walls of the areas, and also the whole of the interior of the out-buildings of the premises.

R. C. skirting.

1922. To put round the intended kitchen and round the intended scullery, skirtings of the best quick pure Parker's cement, 8 ins. high, ¾ in. thick, and coloured light drab.

CHAPTER XI.

R. C. stucco. (See § 1845.)

1923. To execute in Parker's cement stucco, in the very best and most workmanlike manner, the lower part of the fore-front of the dwelling-house, according to the drawings, the work thereof being first roughly coloured while yet soft in portions as soon as done, and the whole of the said work being drawn and when dry completely coloured to imitate stone: and to render level and stucco in a similar manner the upper string-course of the same front.

PLUMBER.

New 6 lb. milled-lead to gutters and dormers.

1924. To take up all the present lead from the gutters of the dwelling-house, and when the gutter-boards are altered as described in the carpenter's work, to lay the same with new milled-lead weight 6 lbs. to the foot superficial turned up 5 ins. high against the brick-work and 9 ins. high against the lear-boards.

To cover with similar lead the sides of the dormer, turned down over the slates 8 ins. on each side.

4 lb. milled-lead to hips and ridges.

1925. To cover the hips and ridges with 4 lb. milled-lead 16 ins. wide properly secured and dressed.

4 lb. milled-lead flashings.

1926. To put in the brick-work round the gutters, flashings of 4 lb. milled-lead 5 ins. wide.

Old lead-work.

1927. To repair thoroughly and dress the gutters of the workshops and all the other old lead-work so requiring.

Waste-pipe to sink.

1928. To put to the intended new sink in the basement-story, a very strong lead 2½-in. waste-pipe fixed with a large brass bell-grate.

Other pipes.

1929. To examine, repair, and make complete all the other lead pipes of every kind belonging to the whole of the premises.

PAINTER.

Preparation.

1930. To knot, stop, pumice smooth, and prepare properly, all the wood-works and other works usually painted, of the inside and of the outside of the house and premises; and to burn off therefrom all such blistered and other defective parts of the painting as may so require in order to execute properly the new painting.

5 times in oil to iron-work.

1931. To scrape and clean thoroughly all the old iron-work of the premises, and to paint five times with the best oil-colour all the old iron-work and all the intended new iron-work of the premises, the first three coats thereof being done with red-lead paint.

4 times in oil to new wood-work.

1932. To paint four times with the best oil-colour the whole of the new wood-work usually painted of the whole of the premises.

Twice in oil to old work.

1933. To bring forward where requisite with two or more extra coats of colour as occasion may require, and in addition thereto to paint twice with the best oil-colour all the old works

usually painted of the inside and of the outside of the whole of the house and premises.

Colours, &c.

1934. The sashes are to be finished externally light drab; the front area railing is to be finished green; the front door is to be finished green, and is to be twice varnished with the best copal varnish, and is also to have the number of the house painted thereon; all the remainder of the painting is to be finished with such teints of stone-colour, drab, or other plain colours as the Surveyor may direct.

Tarring.

1935. To cover thoroughly twice over with the best Stockholm tar the whole of the weather-boarding of the out-buildings except that part thereof which is next the yard and which is intended to be painted.

GLAZIER.

2nd glass.

1936. To glaze all the new sashes with new second Newcastle glass properly bedded, bradded, and back-puttied.

Repairs.

1937. To cut out and make good with new glass to match all the defective parts of the remainder of the glazing throughout the whole of the premises which has more than one simple crack in a square.

Cleaning, &c.

1938. To clean immediately prior to the rendering up of the works as complete all the glazing of every kind throughout the whole of the premises, and to leave them perfect all the glass of every kind.

CHAPTER XII.

A SPECIFICATION *of Works to be done to the House and Premises in the City of London, in the occupation of* , *in the* ERECTION OF A NEW PARTY-WALL, *and in the performance of other works and improvements to the said House and Premises.*

(*For notice to survey old party-walls, see* § 38 *of the Act of* 14 *Geo.* 3.)

BRICKLAYER.

Notice, &c. to District-surveyor, &c.

1939. To give to the District-surveyor, to the surveyor of pavements, and to all other public officers the requisite notices, and to pay to each of them their proper official fees and charges.

Assist carpenters in pulling down, shoring up, &c.

1940. To assist the carpenters in taking down the work which will be of necessity removed in order to rebuild the party-wall, so far as bricklayers may be required in and about the same; and to assist the carpenters in like manner in fixing all shores, struts, stays, or posts, which it may be requisite to place upon or against the premises for their security during the execution of the works.

Shoring to adjoining premises not included in the contract.

1941. But should any such work be required for securing and shoring up the buildings or premises adjoining to the East

side of the said party-wall a separate account is to be kept thereof that the same may be hereafter charged by to the party concerned as directed by § 41 of the Act 14 Geo. III.

s to ad-remises.

1942. Should the parties interested in the premises adjoining East to the new party-wall require any chimneys or piers to be built with the same for their use, such must be done wholly at their expense and by a separate arrangement between them and the contractor. (*The adjoining parties can compel those who build a party-wall to build also such chimneys therein as such parties may require*, see § 30 of 14 Geo. III.; but it does not seem that the builder of the party-wall is compelled to construct such chimneys at the losing price mentioned in that act for party-walls, but is entitled to the "*whole*" expense thereof. See also § 41 of the same act, where there is no mention whatever of chimneys included in the admeasurement and price of party-walls.)

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1943. But the whole of the work of the new party-wall is to be built under this contract at the expense of and all sums of money recovered from the parties interested in the adjoining premises are to be paid over to .

irement, e old k in the ll, &c. of the eo. 3.)

1944. The old brickwork of the party-wall is to be admeasured before the same is taken down, that the quantity thereof belonging to the adjoining premises may be ascertained, but the old brickwork of the chimneys on the East side of the party-wall is to be left on the adjoining premises for the parties interested therein to dispose of the same as they may think fit: all the timber found in the old party-wall is to belong to the carpenter.

ty-wall. kness see 0. 13. 2, of the eo. 3; and de see ie same

1945. To take down the present old East party-wall as far back from the street as the South partition of the back rooms, and as low down as the haunches of the vaults; to repair thoroughly the whole length of the basement-part and foundation of the party-wall, by cutting out all the defective bricks and settlements found therein, and entirely raking out the mortar from all the joints and pointing and repairing the same with good stone-lime mortar and hard stock-bricks.

1946. To erect from thence upwards a new party-wall of the first-rate or class of building, with chimneys on the West side thereof, according to the drawings.

1947. The new party-wall is to be connected in the best possible manner with the old work, but is to be built at first (and so to remain till settled) as that the new work may not hang tightly or strain upon any old work in any part, and the contractor is to repair all injury which may occur to the new work or to the old work by the sinking of the new party-wall.

1948. To finish all the party-wall with brick-on-edge and double plain tile cresting, both laid in and jointed with Parker's cement and Thames sand mixed together in equal measures, and to finish all the new chimney-shafts in a similar manner.

:.

1949. To properly turn, parget, and core all the new flues; to put a good first-sized chimney-pot over each flue, set with plain tile flanchings, the chimney-pots and the flanching thereto

both set in Parker's cement and Thames sand mixed together in equal measure; to make complete and to reset the other chimney-pots of the other parts of the premises in the same manner as those last described, and to put a new brick 4-in. trimmer and a chimney-bar 3 ins. by ½ in. to each new fire-place.

Bedding, &c.

1950. To bed all the plates, bond, and other timber required in the new brickwork.

Fore-front.

1951. To take down and rebuild in Parker's cement, and Thames sand mixed together in equal measures, all the front parapet, to repair generally, clean, and tuck-point the whole of the fore front of the house, and to repair, re-set, and restore the arches and other gauged-work thereof where the same are sunk, broken, or decayed.

Back-front, &c.

1952. To erect such partial scaffolding as may be requisite, and to examine, rake out all the loose and defective mortar from the joints thereof, repair, and where requisite point with blue mortar, the back front and the Western return to the same, more particularly round the apertures at the upper part, and withinside the parapets thereof.

Vault.

1953. To complete in 9-in. brickwork laid in Parker's cement and sand in equal measures as last described, the vaulting under the shop where the same near the front is broken away, and is at present covered over with wood; and to fill up and repair the rents in the same vaulting with hard stock-bricks and tiles set also in Parker's cement and Thames sand mixed together in equal measures.

Roof.

1954. To strip and re-tile to a close guage the whole of the roof, using thereto entire new heart of fir double laths and only such of the old tiles as may be found whole, sound, and undecayed, and finding all requisite new sound tiles to make up all deficiency in the old tiles, to fillet the roof with Parker's cement, strong cast-iron nails being first driven into the brickwork not more than 3 ins. apart to hold the same; and to secure all the ridge-tiles and hip-tiles with T nails and hip-hooks all dipped in melted pitch; to repair thoroughly, rake out all the mortar from the joints, and point with stone-lime blue mortar all the brickwork in and about the roof which is not already described.

Materials.

1955. The whole of the old brickwork taken down from the old party-wall and from the chimney-stack on the West side only thereof is to be entirely removed immediately from the premises, and the whole of the new brickwork is to be done with the very best approved new hard-burnt grey stock-bricks (without any admixture of soft bricks, place bricks, or other inferior bricks) and is to be laid in and to be entirely flushed up at every course with mortar, and is to be grouted at every alternate course with liquid mortar; the mortar is to be compounded in the proportion of one third by measure of the best Dorking stone-lime and two thirds by measure of sharp Thames sand; no four courses of the brickwork are to rise more than one inch, exclusive of the height of the bricks. (See §§ 353—365, and 1010.)

Rubbish.

1956. To clear away from the premises from time to time all

rubbish which may result from the execution of the different artificers' works.

MASON. (See §§ 265—95.)

gs. 1957. To take off all the stone copings, and to square and reset the same with copper cramps run with lead, and making good all deficiency and decay with new stone corresponding in nature and scantling with the original stone.

chimney- 1958. To put to the fire-place of the front attic, new inch Portland stone jambs mantle and shelf 6 ins. wide, side slips 3½ ins. wide of inch Portland stone, and a 2-in. Portland stone chimney-slab.

-pair chim-iece. 1959. To repair and put to the three-pair front room the chimney-piece to be taken from the room below the same, and to provide and bed to the same fire-place a new 2-inch Portland stone chimney-slab.

air chim-iece. 1960. To put to the front room a new marble chimney-piece and a chimney-slab, in value together 12 guineas, exclusive of the fixing thereof.

air chim-iece. 1961. To put to the front room on the one-pair story a new dove marble chimney-piece, in value 10 guineas, exclusive of the fixing thereof; and to repolish and reset to the same fire-place the old marble chimney-slab thereof.

en chimney- 1962. To cramp the broken chimney-jamb in the kitchen, and to repair otherwise as may be found requisite the kitchen chimney-piece.

hs. 1963. To put to all the new front chimneys, new back hearths of rubbed Yorkshire stone.

CARPENTER AND JOINER. (See §§ 337—40.)

party-wall. 1964. To remove carefully all the fittings and finishings on the west side of the east party-wall, as far back from the street as the south partitions of the back rooms.

ng, &c. 1965. To shore up properly the several floors, the roof, and such other parts of the premises as may so require on account of taking down the old party-wall and building the intended new party-wall.

ng and fit- of adjoining lses not in- d 1966. The necessary removal of the fittings of the adjoining premises, and the shoring up of the same (if any) are not to be included in the contract, but a separate account thereof is to be kept. (See § 41 of 14 Geo. III.)

and plates. 1967. To put in the new party-wall to each story of the house, three tiers of new fir bond-timber 4 ins. by 2½ ins., properly lapped and spiked; to put to each of the floors and to the roof a new fir plate 4 ins. by 5½ ins.

Floors.

1968. To raise up and make good the sunk timber-floors against the new party-wall, and to remove all the defective or rotted timbers which may be discovered by the opening of the building, and to reinstate the same with new fir of proper scantlings.

Roof.

1969. To repair all the timbers and wood-work of the roof; to take out and reinstate with new fir timber all the defective timbers; to fir up the rafters; to hip the east end of the front roof, putting the requisite new rafters and hips; to make good the gutter-boards and bearers where requisite, putting new gutter-boards of 1¼-in. yellow deal from the flat to the front, and wherever else may be requisite; to make good all the lear-boards, putting new lear-boards where the same are required; to put an 1¼-in. yellow deal trunk (to be lined with lead) 7-ins. wide to conduct the water from the gutter leading from the flat down into the front gutter. To repair and make good all the other wood-work in or about or connected with the roof.

Partitions, &c.

1970. To refix and make good to the party-wall the several partitions, timbers, and other works which are not herein more particularly described.

Attic story.

1971. To take down the partition across the front attics, and to inclose the entire end of the attic next the sink so as to form three closets, to put two tiers of inch shelves round each of two of the closets, and to put a good lock and key to each of the doors; to inclose in like manner as closets the spaces at the sides of the fire-place, to refix the drawers in one of the same closets, and fit up the other closet with a rail with turned pegs framed thereinto.

Three-pair story.

1972. To make good the boarded floor and the other wood-work and finishings of the front room and middle room; and to put to the front room a new 1½-in. four-panel square framed door, with paneling over the same to correspond with the door; and to hang the door with 3-in. butt-hinges and a best 7-in. iron rimmed lock with brass furniture; to take off, clean, repair, laquer, and refix, all the other ironmongery. To take up and refix the seat and other moveable wood-work of the water-closet, and to attend the plumbers in and about fixing the apparatus and plumbers'-work to the same.

Two pair story.

1973. To examine and repair generally all the joiner's work. To take up the whole of the boarded floor of the front room, to repair and fir up the joists quite level, and to relay as a straight-joint floor the old sound boards thereof, and to make good all deficiency in the flooring-boards with new inch white deal free from sap-wood, and of the same width as the other boards; to repair and make good the other floors of this story; to put to the front windows new astragal and hollow sashes, double-hung with large patent lines and patent roller sash-fastenings, and to repair the sash-frames thereof, and to put new sash-beads thereto; to repair the back sashes and sash-frames, and put thereto new large patent sash-lines; to refix the cornice dado skirtings and other finishings of the front room, and of the middle room; to ease and make complete all the shutters of the story; to put to the back room and to the front room new 2-in. four-panel square framed doors hung with 3½-in. butt-hinges, and the best mortise-

locks with good plain brass furniture. To fit up the back room at the sides of the fire-place with square framed 1½-in. closet-fronts, and doors, and to put in each closet three shelves of inch deal. To take off, clean, repair, laquer, and refix all the other ironmongery.

wo-pair story.

1974. To make good all the boarded floors in a neat and workmanlike manner; to refix and repair the wood cornice; to take away the dado round the front room, and to put instead thereof a plinth of inch deal 8 ins. high, with base mouldings above the same 4 ins. high, with all requisite backings and ploughed grounds; to make perfect all the sashes and sash-frames, and to rehang the front sashes with large patent lines; to examine and repair generally all the other joiner's work; to put to the two doors new best mortise-locks with good plain brass furniture; to put to the front windows new brass shutter-knobs; to take down, set back 2 ft., refix and make complete the partition between the stair-case and the middle room, and to make complete the partition when the closet between the front room and the middle room is destroyed; to take away the glazed folding-doors; to reduce the opening in the partition, and to put a new 1½-in. door to correspond next the back room with the other door, but square on the back, and hung with 3-in. butt-hinges, and with a best 7-in. iron rimmed lock with brass furniture and proper fittings. To repair the back chimney-dressings, and to fit up over the dwarf closet at the side of the chimney with a pair of 1½-best Spanish mahogany folding-doors, with laquered best brass trellis with strong coloured silk laid in very full folds at the back thereof, and with a brass tumbler lock with brass furniture; and to take off, clean, repair, laquer, and refix and make good and complete all the other ironmongery.

e-pair story.

1975. To examine and repair generally all the joiner's work; to make perfect all the floors; to make good against the new brickwork the wainscotting cornice and other finishings; to repair the sash-frames and sashes; to clean and repair the front wainscot sashes; and to repair the sashes with new large patent lines, and the other requisite work and materials; to take away the closet of the front room; to take down, repair thoroughly, and raise 15 ins. the cistern in the kitchen, and to put under the same a complete and large new plate-rack; to put a new handle to the back stairs door; to put a new best mortise-lock with good plain brass furniture; to put new shutter-knobs to the front-room; and to take off, clean, laquer, repair, and refix and make good and complete all the other brass-work.

und-story, inling the shop, counting-se, the passage, the staircases whole of the up.

1976. To take up all the defective parts of the boarded-floor, and in particular that part thereof where there is at present no vaulting (in order that vaulting may be turned), to carefully examine all the timbers, and to reinstate and make good the same with new materials of scantling and description the same as at present, wheresoever the old timbers are defective or decayed; and to make good the floor with sufficient new 1½-in. well-seasoned yellow deal clear of sap-wood.

1977. To examine, repair where defective, and prepare for painting all the other works; and to take off, clean, repair, laquer,

and refix and make good and complete all the ironmongery and locks.

Alteration to stairs and passage.

1978. To take down the principal staircase from the ground-story to the one-pair story, and to substitute instead thereof a flight of stairs to correspond in finishings and plan as far as possible with the upper flights of the present stairs, and upon the same side of the house, with balusters, Spanish mahogany wreathed hand-rail, scroll, and curtail complete.

1979. To trim a well-hole for the staircase, and to put proper inch linings round the same; to put joists and floor to correspond with the other parts of the story in lieu of the present stairs and bulk-head on the East side of the house.

1980. To take down the partitions of the closet on the one-pair landing, and to alter, enlarge, and refix the same with two doors, so as to form a closet from the kitchen and a closet from the landing divided by a partition between the same, but leaving the landing two feet wider than at present; to alter, enlarge, and refix the dresser withinside the two closets; and to put round each of the closets three shelves of inch deal 10 ins. wide with proper bearers.

1981. To take down the partition and door of the passage; to repair, alter, and refix the same on the West side of the house so as to leave a new passage 5 ft. wide; to line the wall of the passage with inch framing and other finishings to correspond with the partition; to fir down quite level the ceiling of the new passage, and to fir level the passage-floor and case the same over with inch yellow deal battens clear of sap-wood; to line round with $\frac{3}{4}$-in. beaded and tongued deal the entrance doorway, and to put round the other doorway a moulded architrave 6 ins. wide.

1982. To take out the present shop-sash; to alter the stall-board, and form a new entrance doorway to the new passage with story-posts and linings round the same; to provide and hang a new $2\frac{1}{2}$-in. bead-flush and handsome moulded four-panel double-margin door 3 ft. 6 ins. wide and 7 ft. high with Redmund's patent hinges, a very best strong 12-in. draw-back lock, two 12-in. bright barrel-bolts, a pair of handsome brass knockers, and a shoe-scraper; to put over the doors a moulded transom and a 2 in. Spanish mahogany fan-light of the width of the door, and glazed with three squares of plate-glass; to put in the doorway a 2-in. moulded oak threshold 10 ins. wide.

1983. To move the story-posts and folding-doors leading to the shop, more to the East, and where the present private door now stands; to alter and refix the shop-sash, to make good the glass to the same, and to make good all the wood-work beneath or connected therewith.

1984. To refix and make good the pilasters on the outside of the shop-front, and to provide new pilasters for the sides of the doorway to correspond with the other pilasters; to repair the entablature and all the other wood-work belonging to the shop-front.

1985. To line the side of the shop against the new party-wall, with inch deal tongued and beaded, upon proper furrings and backings; to make good the inclosure of the back-stairs after the principal stairs are taken down; to alter, adapt, and refix the partitions of the counting-house after the new stairs are fixed; and to make good the glass to the same.

PLASTERER.

ic-story. 1986. To make good to the new party-wall, with the requisite new lathing and plastering; to wash, stop, and repair all the remainder of the plastering of the story; to whiten all the ceilings thereof, and to colour the walls of the back room and of the middle room.

ee-pair story. 1987. To make good to the new party-wall, with the requisite new lathing and plastering; to wash, stop, repair and whiten all the ceilings of the story; to render float and set all the new brick-work; to strip off all the old papering (except that to the back-room, which is to be carefully preserved from damage) and to prepare the other walls for re-papering the same.

-pair story. 1988. To put a new floated and whited ceiling to the front room; to repair, wash, stop, and whiten the other ceilings of the story; to render float and set all the new brick-work; and to strip off the paper from, and wash, stop, repair, and complete as low as the skirting, all the rest of the sides of the rooms (mem.: it is intended that the inclosure of the middle room shall be set back; it is also intended that the wood dado round the front room should be taken away.)

-pair story, 1989. To make good to the new party-wall, with the requisite new lathing and plastering; to wash stop and repair only the front ceiling; to make good, repair, wash, stop, and whiten the plastering in the large light closet; to repair, wash and stop the plastering of the kitchen, of the closets adjoining to the kitchen, and of the back stair-case; and to colour all the walls and sides of the same.

and story. 1990. To make good the ceilings to the new party-wall, and to wash stop and whiten the plastering of the shop.

rcase and age. 1991. To strip off all the papering, and repair wash and stop the whole of the plastering; to whiten all the ceilings and strings; to put a new floated ceiling to the intended new passage, with a cornice 12 ins. girth all round the four sides of the same, and a floated soffit with reveals to form an architrave across the end of the passage, and with a pair of ornamental plaster consoles under the same.

(For Plumber's work, Painter's work, Glazier's work, and Paper-hanger's work, see Index.)

CHAPTER XIII.

***SPECIFICATION** OF THE ARTIFICERS' WORKS to be done in the general reparation of the Houses, Buildings, and Premises, Nos. , WHICH HAVE BEEN CONDEMNED by the COURT LEET as ruinous, including new party-walls thereto, and for the performance of other works connected with the said premises.*

BRICKLAYER.

1992. *By the 70th § of the Building-act, "an inquest or grand "jury in London," or "any annoyance jury within the city and liberty "of Westminster," or "the jury sworn at the court leet held by the "sheriff in his turn for any hundred or place," or "any other jury or "inquest sworn within any other part of the limits aforesaid," is acknowledged to have power to condemn ruinous and dangerous buildings; but as the presentments in such cases frequently are only made by a common hired substitute-constable, such presentments and such condemnations are not unfrequently very capricious, through the little knowledge of the subject possessed by the parties holding the power: cases have occurred in which, condemnations having originated in malice, or in a desire to run down the value of property from interested motives, such condemnations have been reversed upon a threat to indict for conspiracy all the parties concerned in such condemnation.*

Notice, &c. to District-surveyor, &c. &c.

1993. To give to the District-Surveyor all the requisite notices, and to pay to him his proper official fees; to obtain all requisite licenses from the Surveyor of Pavements and other public officers, and to pay all official dues and charges of every kind attendant thereon.

Digging, &c.

1994. To perform all digging and removal of ground which may be requisite for the execution of the several works intended to be done under this specification; to fill in the ground as far as may be requisite to the several parts of the premises; and to remove and cart away all the superfluous earth and ground remaining after the premises have the ground filled up to the proper levels.

Rubbish, &c.

1995. To clear away from all the buildings and premises at which the several works are intended to be done all rubbish and useless materials from time to time as the same may arise from the performance of the various works; and to leave finally the whole of the said buildings and premises free therefrom.

New party-walls. (See § 4 of 14 Geo. 3.)

1996. To erect to the North side of the house No. and to the North side of the house No. new first-rate party-walls of the several thicknesses required by the Building-act, and with chimneys therein of the dimensions shown by the drawing, composed entirely of the best new grey stock brick-work, and finished on the tops thereof with brick-on-edge and double plain tile cresting, both set in and jointed with new quick Parker's cement and clean Thames sand mixed together in equal measures.

Chimneys

1997. To take down and remove altogether the chimney-stack of the house No. ; to take down all the other old

chimney-shafts of the premises; and to rebuild the whole thereof to the same height as at present, using only such of the present bricks as shall be found to remain sound, and providing and applying in and about the same work sufficient additional new hard grey stock-bricks of the best quality. To finish all the new chimney-shafts with salient-courses 6 ins. high, and to put over each flue a sound chimney-pot set in plain-tiles and Parker's cement and sand (as described for the tops of the intended new party-walls), and using the present chimney-pots as far as sound and undecayed, and providing for all deficiency new first-sized chimney-pots.

1998. To under-pin carefully with sound new hard-burnt grey stock-bricks set in equal measures of the best new quick Parker's cement and clean Thames sand, the whole of the present old chimney-stacks of the premises; and to examine, repair, point, and make complete where requisite all the other parts of the chimneys.

1999. To put to each of the fire-places of the houses Nos. a 4-in. brick trimmer 12 ins. longer than the chimney-opening. To lower, diminish, and otherwise alter as may be found requisite, the fire-places in the South party-wall of the house No.

ire-fronts of the e houses.

2000. To cut out all the defective bricks to the settlements in the fronts next of the houses; to repair and make good and complete in a workmanlike manner the whole of the defects in the same fronts with the best new grey stock-bricks; to rake out the mortar from the whole of the joints of the fronts of the houses, to colour and flat-joint point with the best stone-lime dark coloured mortar the whole of the same fronts; and to reset in Parker's cement and make complete the copings of the same fronts.

nd wall.

2001. To inclose the South side of the house No. from the party-wall to the fore front of the house with a new wall of the best grey stock brick-work as described for the intended new party-walls and faced externally with picked stocks of a bright uniform colour; the said wall is to have two courses of footings three bricks thick and two courses of footings two and a half bricks thick, the whole of the footings being 6 ins. below the basement-paving, and the said wall from thence to the under side of the ground floor is to be two bricks thick, and is to be one brick and a half thick from thence upwards.

ack-fronts, &c.

2002. To repair and make good where defective with the requisite new grey stock-bricks all the brick-work of the backs of the houses and all the brick-work of the building projecting from the rear of the same houses; and to rake out the defective mortar from all the joints thereof, and to point with stone-lime blue mortar the backs of the houses and other brick-work above mentioned, where requisite, in order to render the brick-work complete and perfect.

ading, &c

2003. To bed in mortar all the bond-timber plates lintels wood-bricks templets and other timbers and works so requiring; to bed and point with lime and hair mortar all the new door-frames

PART II:

... and all the other door-frames and window-... to be painted: to back up with solid ... brick-work and other things set or ... brick-work

... the old adjoining brick-work proper ... requisite in order to receive the ... make good in a workmanlike ... and defective brick-work uniting with the ... work

... the several houses with hard stock-... between the joints with liquid ...

... the tiling of every kind from ... Nos. ... and from all the roofs ... from the present old tiling ... only as remain sound ... and cart away from the ... the whole of the afore-... the same double laths, using the ... stated and providing ... new sound tiles sufficient for ... tiles, and to complete the ... laid in stone-lime ... is to be secured ... to be secured by a ... a proper wrought-... all the tiling is ... Parker's cement and ... nails being ... apart to secure ...

... the principal drain ... Nos. ... with the yards of the ... by all the cess-pools ... the several houses ... the above drainage-... value of 10*l.* as the sur-...

... brick-work of the present two ... requisite brick-work for the ... Nos. ...

... under the contract for the ... reduced of the best grey ... lime mortar (and of the same quality ... specification described) to be used ... as the surveyor may direct in addition to ... requisite for the thorough completion of the ... walls and the other intended works and the intended repairs and the appertenances thereof; the value of all such of the quantity of the said extra three rods reduced of brick-work as may not be directed by the surveyor to be so used is however to be deducted from the amount of the consideration of the contract

for the execution of the works after the rate of per rod reduced; and in like manner to provide and execute such further additional brick-work of the description last described as the surveyor shall direct at the price of per rod reduced.

ks. 2010. All the bricks to be used in and about the intended works to the several houses buildings and premises are to be (except where herein otherwise directed) the very best new approved hard-burnt square grey stock-bricks free from breakage and from all admixture of soft bricks place-bricks or other inferior bricks.

tar. 2011. The whole of the mortar to be used in the brick-work is to be compounded in the proportion of one third by measure of the best stone-lime and two thirds by measure of clean sharp Thames sand properly beaten and worked up together.

e of doing work. 2012. No four courses of the brick-work are to rise more than one inch besides the height of the bricks; all the brick-work (except the front work) is to be carried up in every part and through the entire thickness thereof with English bond; every course of the brick-work is to be filled in and to be fully flushed up with mortar; and every alternate course of the work is to be thoroughly grouted with liquid mortar. (See §§ 353—365 and 1010.)

folding. 2013. To provide, maintain, alter as occasion may require, and finally take down remove and cart away from the house buildings and premises, all scaffolding which will be requisite for the performance of the whole of the intended works of every kind of all the several houses buildings and premises, and with sufficient poles cords wedges ropes planks ladders tackle and all other proper appertenances.

ling-work. 2014. To perform all bricklayer's work of every kind which may be requisite in the nature of jobbing to the several houses buildings and premises and to the appertenances thereof.

MASON. (See §§ 265—95.)

ieilles. 2015. To put in the South party-wall of the house No. a corbeille for the support of the end of each girder of the floors, each corbeille is to be composed of a piece of granite curb 7 ins. by 10 ins. and 18 ins. long.

nney-pieces, 2016. To put to each of the fire-places of the houses Nos. jambs mantle and shelf each of 1¼-in. Portland stone 6 ins. wide; and to put to each of the same fire-places a back hearth of 2½-in. rough Yorkshire stone, and also a chimney-slab or front hearth of 2-in. Portland stone 18 ins. wide and 18 ins. longer than the chimney-opening.

2017. To repair and make good with the requisite new jambs mantles and other work, the whole of the present chimney-pieces of the houses Nos. ; and to repair, relay, and make good as far as requisite the whole of the hearths,

foot-paces, and slabs thereof, not however renewing those hearths, foot-paces, and slabs which are merely cracked.

Paving.

2018. To pay to the proper city authorities the expense of relaying and making good all the public paving which will be disturbed, injured, or affected by the execution of the intended repairs and works; and to relay and make good all the pavings belonging to the several houses and premises which will be taken up or which will be injured by the execution of the intended works.

CARPENTER and JOINER. (See §§ 337—40.)

New materials, &c.

2019. To provide sufficient new materials for and frame and fix all carpenter's work and joiner's work of every kind which may be requisite for carrying into effect and for finishing and completing the intended works and repairs to the several houses, buildings, and premises, Nos. ; and to fix in and about all the said carpenter's work and joiner's work all proper and necessary nails, spikes, hold-fasts, wall-hooks, screws, and other ironmongery of the very best quality.

Timber and deal.

(See § 1031—2.)

Sundries.

(See § 1033.)

Centering.

(See § 1141.)

Hoarding, shoring, &c.

2020. To provide, maintain, alter as occasion may require, and finally remove, safe and close hoarding sufficient for the inclosing of all the houses, buildings, premises, and building-materials, during the performance of all the intended works; to provide, set up, maintain, and finally remove, such bridge-ways and other accommodations for passengers as the proper authorities may during the progress of the works require. To provide, fix, and maintain, to every part of the houses, buildings, and premises upon which the intended works are to be executed all shores, braces, needles, and wedges, and other materials, works and appertenances proper to, and fit for complete and safe shoring, and which may be necessary to the said several houses buildings and premises, in order to perform properly the intended works and alterations thereto; and to shore up and secure by the like means as far as may be necessary in consequence of the performance of the said works and alterations, all the premises of every kind which adjoin or communicate with any of the aforesaid houses buildings and premises, or which may be in any manner endangered by the execution of the intended works.

All the shores and all the hoarding at present set up to the five houses are to become the property of the contractor.

Bond-timber and wood-bricks.

2021. To put in each story of the new brickwork above the basement, two complete tiers of yellow fir bond-timber in as long pieces as possible, scantling 4 ins. by 2½ ins. and properly lapped and spiked; and to put all wood-bricks requisite for fixing properly the joiner's work and other work in need thereof.

Wall-plates

2022. To put in the new brickwork the requisite wall-plates

for the floors and roofs of new fir scantling 4 ins. by 4 ins. properly scarfed.

2023. To take up all the flooring-boards of the ground-story (those to of the house No. excepted); to use the sound parts of the same flooring-boards in repairing the attic-floors of the five houses, and to provide and apply in addition thereto, new inch white deal wrought flooring-boards sufficient for repairing and completing the whole of the said attic-floors. To lay to the whole of the ground-story of each house (the of the house No. excepted) entire new boarded floors of inch white deal wrought and laid folding; to repair and make complete all the other boarded floors of the five houses and of the other buildings and premises, providing and applying therein at least ten squares superficial of inch white deal wrought flooring-boards. The whole of the flooring-boards are to be fixed with the requisite firrings.

2024. To repair, reframe, and refix, as far as requisite, and make complete all the timber-work of the several floors of the five houses, using in and about the said work at least 200 cubic feet of new fir in such joists and other timbers as may be by the Surveyor directed.

Roofs.

2025. To repair thoroughly, reframe, refix, and fir up where requisite, and make complete, the whole of the wood-work of the roofing of the five houses and of the out-buildings thereof, providing and applying in and about the said work 75 cubic feet of new fir timber at the very least, in such rafters, ties, plates, beams, and other work as the Surveyor may direct; to take away the flat over the house No. , and to put instead thereof a span roof similar to those of the other houses; to take up all the guttering of the whole of the roofing, and to put entire new gutters of inch yellow deal clear of sap-wood, laid on strong yellow deal bearers to currents 1½ in. to every 10 feet run, and with 2½-in. drips, so disposed as that no sheet of lead shall be more than 16 ft. long, and no part of the guttering is to be less than 9 ins. wide; to put against the rafters at the sides of all the gutters lear-boards of ¾ in. yellow deal 8½ in. wide; to put to the whole of the roofing the requisite springers, tilting-fillets, and other proper and usual work.

2026. To repair thoroughly the dormers; to put thereto new inch deal ledged outer trap-doors, hung with strong cross-garnet hinges and with a bolt to each; and to put beneath each dormer an inner trap-door similar to the outer trap-door and with the like hinges and bolts.

2027. To put over the stair-case of the house No. , a 2½-in. yellow deal sky-light containing 20 ft. superficial, with inch deal linings and all proper fittings complete.

2028. To repair thoroughly all the remainder of the wood-work of every kind connected with the roofing of the five houses and of the out-buildings thereof, providing the requisite new materials.

Partitions.

2029. To repair thoroughly and refix as far as requisite the

several timber and framed partitions of every kind of the whole premises, putting thereto new timbers panels styles rails and the other needful work in lieu of such of the timbers, panels, styles, rails, and other work thereof as are either lost or are defective.

2030. To inclose the intended new stair-case of the house No. 48, , and two closets on each story adjoining to the same stair-case, with quartered-partitions with plates 4 ins. by 4 ins. end posts king-posts door-posts and door-heads 4 ins. by 3½ ins., braces 4 ins. by 3 ins., quarters 4 ins. by 2 ins., and two tiers of inter-ties to each story 2 ins. by 1¼ in.

400 ft. superficial new 1½ square framed partitions, doors, &c.

2031. To provide and fix in the situations which the Surveyor may direct, in addition to the other partitions and doors of the houses buildings and premises, 400 ft. superficial of 1½-in. square framed partitions, with ten four-panel square framed doors therein, with beaded stops, and hung each with a pair of 3-in. butt-hinges and a 6-in. iron rimmed good lock, with plain brass furniture.

Skirtings, &c.

2032. To restore and make good, with the requisite labour, and new materials, the skirtings and other wood-work to the new brickwork, so as to correspond properly in the several parts of the houses, buildings, and premises with the other skirtings and other wood-work thereof.

Story-posts, breast-summers, shop-fronts, &c.

2033. To examine carefully the several story-posts and breast-summers of the five houses; to perform all work and labour requisite in the reparation thereof; and to use in and about the said work 10 cubic feet at the least of new Baltic fir.

2034. To repair thoroughly in a workmanlike manner, and make complete all the sashes, shutters, fascias, pilasters, linings, and other woodwork of every kind belonging to the shop-fronts and to the other wood-fronts next ranging and connected therewith.

To repair and make complete the bars and other fastenings and iron-work of the shop-front shutters.

To alter the shop-front of the house No. , and to complete the same with a new 2½-in. bead-flush and square framed sashed door hung with three 4-in. butt-hinges, a bead-flush and square shutter, and all other requisite fittings and appertenances.

Doors, &c.

2035. To take off, repair thoroughly, and rehang with the requisite new hinges and other fittings the whole of the doors and gates of every kind belonging to the whole of the houses, buildings, and premises, and to provide and hang in the several houses, buildings, and premises, new doors to correspond in quality severally with the next adjoining doors, in lieu of such doors as are either lost or are so defective as not to be worth reparation.

New windows.

2036. To provide and fix in such parts of the premises as shall be by the Surveyor directed, one hundred and fifty feet superficial of new 1½-inch ovolo sashes double-hung with large patent lines, brass axle-pulleys, iron weights, and patent spring fastenings in proper deal cased-frames with English oak sunk sills.

Old windows.

2037. To repair thoroughly in a workmanlike manner and

make complete all the other windows, lights, casements, and window-frames of every kind throughout the whole of the houses, buildings, and premises; and to rehang with large patent lines and the requisite hinges and other fittings and proper appertenances, the whole of the sashes and casements thereto.

2038. To repair and make good all the linings and other fittings of the windows of all the houses and premises; and to repair, ease, and rehang, such of the window-shutters as stand in need thereof.

-cases. 2039. To erect in the centre of the house No. , a new stair-case from the ground-story upwards to the attic story, with treads, landings, and risers of 1¼-in. yellow deal on strong bracketed carriages, 1¼-in. string-boards and wall-strings, framed and turned newels, 3½ ins. by 3½ ins., bar balusters 1-in. square, strong deal moulded hand-rails, inch deal apron-linings, and all other proper fittings and appertenances.

2040. To repair thoroughly the stair-case of the house No. , putting thereto entire new treads and landings of inch deal and the other requisite work; to repair thoroughly the other stair-cases of the houses, putting new nosings 3 ins. wide to the whole of the treads and landings thereof; and putting thereto also the other requisite work; to repair and make complete all the balusters, hand-rails, newels, and other fittings of the several stair-cases, and to reinstate such of the fittings of the stair-cases as are lost.

es. 2041. To repair thoroughly the wood-work of the privies of the houses Nos. , and to provide and fix at the premises of the houses Nos. , wood-work and fittings for two privies, in quality similar to those of the other privies.

sers and fittings. 2042. To repair thoroughly, and make complete all the dressers, shelves, closets, and other internal fittings of the several houses, buildings, and premises, and to provide and fix therein where the Surveyor shall direct, additional new fittings to the full value of £10.

irs. &c. to ther work. 2043. To repair and make complete in a workmanlike manner all the other old carpenter's work and joiner's work of every kind (not herein before particularized) belonging to the whole of the houses, buildings, and premises Nos. ; and to prepare properly for painting all the wood-work usually painted.

mongery, -work, &c. 2044. To take off all the present locks, fastenings, ironmongery, and brass-work of the whole of the houses, buildings, and premises; to clean, repair, laquer, and refix such thereof as may remain sound and fit to be again used; and to provide and fix sufficient new ironmongery and brass-work of the best plain quality to make up all deficiency in the old ironmongery and brass-work.

ing work. (See § 1070.)

ubic feet fir timber. 2045. To provide and fix under the contract for the execution of the works, one hundred and fifty cubic feet of the very

best Baltic fir timber clear of sap-wood and all other defects, to be used in such additional rafters, quarters, joists, or other unplaned timber-work as the Surveyor may direct to be used in addition to the timber-work fully necessary for the thorough completion of the intended repairs and work, the value of all such of the said extra fir timber as may not be directed by the Surveyor to be so used is however to be deducted from the amount of the consideration of the contract for the execution of the works after the rate of per cubic foot, and all further additional timber work of the like kinds which the Surveyor shall direct to be used is to be provided and fixed by the contractor at the like price of per cubic foot.

SMITH.

2046. To provide for each of the intended new fire-places of the houses Nos. a wrought-iron chimney-bar 2½ ins. by ½-in. properly corked at the ends thereof, and at least 20 ins. longer than the chimney-opening.

2047. To provide and fix 10 cwt. of iron in such straps, ties, stirrup-irons, screw-bolts, nuts, washers, and other light wrought and hammered work as may be by the Surveyor ordered for the several houses, buildings, and premises, and to make all alterations requisite thereto: all additions to, and all deductions from the said quantity of 10 cwt. of wrought-iron work is to be taken after the rate of per lb. avoirdupoise, including the fixing thereof.

PLASTERER.

Outside stucco.

2048. To cover with the very best Dorking stone-lime stucco upon heart of fir double laths drawn and coloured to imitate stone, the back external timber-inclosures of the several houses, and the timber external inclosures of the out-buildings projecting in the rear of the said houses.

To wash stop repair and colour the external stucco of the bow-windows of the house No.

New ceilings and strings.

2049. To put to the whole of the ground-story and to the whole of the upper-story of each of the five houses, to the one-pair story of the houses Nos. , and to the new stair-case of the house No. , new lathed plastered and set ceilings and strings of the stair-cases. The present laths may be used again as far as sound, unbroken, and undecayed.

To make good in a similar manner the portions of the other ceilings which on account of the building of the new party-walls will so require.

New rendering and setting.

2050. To render and set all the new internal brickwork of the five houses.

Old plastering.

2051. To cut down the defective lathing and plastering, and to wash, scrape, stop, and repair thoroughly, and make good the lathing and plastering of every kind to the whole of the remainder of the five houses and premises.

[redacted]

ting. 2052. To whiten the whole of the ceilings strings and plaster cornices, of the five houses and of the out-buildings thereof.

uring. 2053. To colour the sides of the whole of the interior of the five houses and of the out-buildings thereof.

(For plumber's work, painter's work, glazier's work, and paper-hanger's work see Index.)

CHAPTER XIV.

PAIRS TO BE DONE *in and about the* ROOF *of the House and Premises situate and being*

BRICKLAYER.

rict-surveyor, (See § 987.)

(*If the repair be considerable, including new brick-work, notice must be given to the District-surveyor.*)

chimneys. 2054. To take down to as low as the roof (or insert as much lower as may be necessary and as the case may require) the South-western chimney-shaft and the chimney-shaft next , and to rebuild the same chimney-shafts, using again only the sound old bricks after the same have been properly cleaned, and providing sufficient new hard grey stock-bricks in order to face the new chimney-shafts wholly with new bricks, and to make up all deficiency in the quantity of the said old bricks.

chimney-s. 2055. To rake out the mortar from all the joints of the other chimney-shafts of the house and premises, to repair thoroughly the brick-work of the said chimney-shafts, providing for the work sufficient new hard stock-bricks and the other requisite materials; and to point all the external brick-work of the old chimney-shafts with the best stone-lime blue coal-ash mortar.

ney pots, 2056. To reset such of the present chimney-pots as will be found undecayed and sound, and to provide and set new chimney-pots sufficient to make up all deficiency in the present chimney-pots; the whole of the chimney-pots are to be flanched round with new plain tiles, and all the chimney-pots and tile-flanchings are to be set in one-half new quick Parker's cement and one half clean Thames sand.

pets. 2057. To take the parapets and walling of the back and of the house down to the bottoms of the arches of the two-pair story, and to rebuild the said brick-work in a neat and workmanlike manner, using only such of the present bricks as will remain perfectly sound, and providing all new bricks requisite for making up all deficiency.

s (if any.) 2058. To clean carefully the sound bricks of the guaged arches which will be taken out in the performance of the intended

works; to provide new cut or guaged bricks to make up the deficiency which will be found in the arch-bricks after setting aside the broken and defective arch-bricks, and to re-set and make good with the new parts thereof the whole of the arches so intended to be taken out, and to tuck-point the same arches when re-set.

To re-set and make good all the other arches which will be disturbed by the performance of the intended works.

Party-walls, &c.

2059. To take off the tile-crestings, the brick-on-edge, and the other defective parts of the brick-work of the tops of the party-walls and of the other walls and brick-work in and about the roofs; to re-place, repair, and make good, all the said brick-work, putting thereto new sound double plain-tile cresting and new brick-on-edge of new sound hard grey stock-bricks: the whole of the brick-on-edge and tile crestings are to be laid in, and to be jointed with one half new quick Parker's cement and one-half clean Thames sand; and all the other brick-work is to be set in good stone-lime mortar. (See § 1009.)

Brickwork within the roof (if any.)

2060. To repair with the requisite new sound grey stock-bricks, all the defective brick-work between the roofing and the upper ceilings; and to rake out the mortar from the joints thereof and point with stone-lime mortar the whole of the said brick-work within the roofing.

Repairs to tiling (if any).

2061. To examine carefully and repair thoroughly the whole of the tiling of ; to take out therefrom all the decayed and unsound tiles; to provide new sound tiles sufficient for making up all deficiency in the present tiles; to reset all the hip-tiles and ridge-tiles in stone-lime mortar with sufficient hair therein *(or in Parker's cement as the case may be)*, each tile thereof being secured by a strong T nail dipped in melted pitch and each hip having a proper hip-hook also dipped in melted pitch, and the plain tiles are to be pegged in the best manner possible; and all the requisite new double laths of heart of fir are to be provided by the contractor.

Tiling wholly stripped (if any.)

2062. To take off the whole of the tiling from . (See Index.)

Bricks, mortar, &c.

2063. To provide all requisite new facing-bricks to match the present facing-bricks, and all requisite new hard well-burnt grey stock-bricks of the best quality: all the bricklayer's work, except where herein otherwise directed, is to be done with the very best mortar, composed of ¼ Dorking stone-lime and ¾ sharp Thames sand.

Colouring, &c.

2064. All the brick-work which is intended to be rebuilt or to be repaired, is to be coloured to match the adjoining brick-work, and is to be wholly pointed with very dark coloured mortar, so that the new work and the reparations may not afterwards when dry show any stain or difference of colour.

Rubbish

2065. (See § 1868.)

Jobbing-work.

2066. (See § 1011.)

CHAPTER XIV.

MASON. (See §§ 265—295.)

Take off copings.

2067. To take off carefully from the present stone copings.

Re-work, re-set, and make good old copings.

2068. To re-square and re-work and throat, where necessary, sand at the outer edge, and re-set the sound and perfect parts of the present stone copings; and to provide new stone coping similar to the present copings to make up all deficiency in the copings of .

New Portland stone copings (if any.)

2069. To cover the parapet of and with new Portland stone coping 13 ins. wide 4 ins. thick in front 2½-ins. thick at the back, throated at both edges thereof, and with solid quoin stones.

New Yorkshire stone copings (if any.)

2070. To cover the parapets of and with copings of new 3 in. Yorkshire stone 13 ins. wide throated at both edges and laid sloping.

Joints, &c.

2071. All the stone copings are to be set in Parker's cement, and are to have all the joints thereof channeled and plugged and run with lead.

Cramps (if any.)

2072. (See §§ 271—284.)

SLATER. (See § 542—3.)

Stripping.

2073. To strip off carefully from the roofs all the present slating.

Slating partly old.

2074. To re-square such of the present slates as will be found after careful examination to remain sound and undecayed, and to cover therewith the roof over as far as the same will go thereto, and to provide the best new sound slates, of the same kind as the other slates of the roof, sufficient for completing therewith in an uniform manner the same roof.

Slating wholly new.

2075. To slate the roofs over with the best new strong countess (or dutchess or other slates as the case may be).

Bond nails, &c.

2076. (See § 1024.)

Pointing.

2077. (*If the slating be laid upon battens it should be pointed on the inside, for which see* § 1023.)

Reparation of accidents.

2078. (See § 1025.)

CARPENTER. (See §§ 337—40.)

Timbers of roofing.

2079. To examine carefully the whole of the timbers and wood-work of all the roofing; to take out and remove therefrom

all the decayed and unsound timbers and wood-work, and to replace the same by new yellow Baltic fir, and new yellow deal of scantling thickness and dimension to correspond *(unless any improvements are intended)* with the former timbers and wood-work.

(The specification may contain a particular description of such rafters or other timbers as are intended to be new, or it may state what cubic quantity of new timber is to be used in the work.)

Firring.

2080. To fir up with yellow deal all the sunk rafters and other timbers in all cases where the same have sunk.

Gutters.

2081. To take up all the (defective) *(this word may be omitted if the whole of the gutters require to be taken up either from decay or insufficiency of drips and currents)* gutter-boards and bearers, and to put (sufficient) new inch yellow deal gutter-boards and new strong yellow deal bearers laid to a current of full 1½ in. to every 10 ft. and with 2½-in. rebated drips, so disposed as that no sheet of lead shall be more than 16 ft. long. To put at the sides of the gutters new ¾-in. yellow deal lear-boards 10 ins. wide.

Slate-battens, &c. (if any.)

2082. To put to the roofs new slate-battens of ¾-in. yellow deal 2½ ins. wide; and to repair and make good with new ¾-in. yellow deal the present slate-boarding (*if any*).

Dormers.

2083. To repair thoroughly and rehang with new strong hinges and fastenings, the outer door and the inner door of the dormer.

To put to the other dormer a new inch yellow deal ploughed, cross-tongued, beaded, and ledged outer-door, hung with a pair of very strong cross-garnet hinges and a strong bolt.

Extra timber-work (if any.)

(See § 1071.)

Quality of timber and deal.

2084. All the new timber and deal are to be thoroughly seasoned and free from sap-wood and from shakes and other defects. (See §§ 1029—33.)

Jobbing-work.

(See § 1070.)

PLUMBER.

Take off old lead-work.

2085. To take off from the roof and gutters all the present lead-work, except (*if any exception*).

New 7 lb. cast lead gutters.

2086. To lay to the whole of the gutters, new cast-lead, weight 7 lbs. to the foot, superficial, turned up full 5 ins. high next the brickwork parapets and other upright boundaries of the guttering, and full 9 ins. high upon the lear-boards (*or state more or less as the case may require according to the pitch of the roof*). (See Index.)

New 7 lb. cast-lead to flats (if any).

2087. To lay the flats with new 7 lb. cast-lead turned up full 5 ins. high all round the edges thereof, properly rolled at all the lateral joints (*the rolls should not be more than 2 ft. 3 ins. apart*) and

properly lapped with 2½-in. drips at the heading-joints of the sheets of lead.

New 7 lb. lead to valleys (if any).

2088. To lay the valleys with 7 lb. cast-lead 20 ins. wide.

New 4 lb. milled-lead to hips and ridges.

2089. To cover the hips and ridges of the (slated) roofs with 4 lb. milled-lead 18 ins. wide (or with 5 lb. lead if that be preferred).

New 6 lb. milled-lead to dormer.

2090. To cover the top sides and door-case of the dormer with 6 lb. milled-lead to be dressed down all round next the roof full 8 ins.; and to put over the sill of the dormer-door an apron of 6 lb. milled-lead 18 ins. wide.

To put to the (*slated*) dormer a ridge of 4 lb. milled-lead 16 ins. wide, flashings all round next the roof of 6 lb. milled-lead 14 ins. wide, and at the foot of the door an apron of 6 lb. milled-lead 18 ins. wide.

New 4 lb. milled-lead flashings.

2091. To put all round the gutters and flats flashings of 4 lb. milled-lead 5 ins. wide.

Step-flashings of 5 lb. milled-lead (if any.)

2092. To put in the brickwork to the ends of all the slating which rake against the same, step-flashings of 5lb. milled-lead average 13 ins. wide.

Curb flashings of 5 lb. milled-lead (if any).

2093. To put at the junction of the curb-rafters with the upper-roofing, a flashing of 5 lb. milled-lead 12 ins. wide.

5 lb. milled-lead flashings to sky-lights (if any.)

2094. To put all round the sky-lights flashings of 5 lb. milled-lead 12 ins. wide.

Repair old lead-work (if any.)

2095. To solder, dress, and repair thoroughly the gutters, flats, and other lead-work (*if any*) of .

Repair R. W. pipes.

2096. To solder, repair, refix, and make complete as far as requisite the lead rain-water-pipes with the cistern-heads and all the other appertenances thereof.

New lead R. W. pipes (if any).

2097. To put to a complete stack of new lead rain-water-pipe 4 ins. bore of 7 lb. milled-lead with strong moulded cistern-head, and secured by tusks, and with all other proper appertenances.

New cast-iron rain-water-pipes (if any).

2098. To put to a complete stack of new cast-iron rain-water-pipe 4½ ins. bore, with cistern-head shoe and fixed complete.

New copper eaves'-guttering (if any).

2099. To put to new 5-in. eaves'-guttering of sheet copper, weight 16 oz. to the foot superficial, and securely fixed on sufficient strong wrought-iron brackets.

New cast-iron eaves'-guttering (if any).

2100. To put to new 4-in. cast-iron eaves'-guttering, put together with white-lead, and securely fixed upon sufficient strong wrought-iron brackets.

2 cwt. extra lead-work (if any).

(See Index.)

Copper-work (See Index.)

PAINTER.

2101. To paint four times with the best oil-colour the copper work-gutters (if any) and the outside and inside of the dormer-doors, and all the weather-boarding and other external wood-work (if any) in and about the roofing.

2102. To scrape and clean perfectly free from rust, and paint five times with the best oil-colour all the pipes and gutters, and all the other iron-work in and about the roofing, the first two coats of colour to the iron-work being done with red-lead paint.

CHAPTER XV.

SPECIFICATION FOR ERECTING *and completely finishing a* LABOURER'S COTTAGE, *on a plot of ground situate at , for , according to the following drawings.*

(Insert here a list of the Working-drawings. See § 986.)

BRICKLAYER.

Excavation, &c.

2103. To excavate the ground for the foundations, cess-pools, and other works which will so require; to fill in and consolidate around the footings and lower parts of the brick-work when executed, as much earth as may be necessary; and to dispose of in making up and raising the site of the cottage, all the remainder of the earth which will be excavated, and of all the rubbish which will result from the performance of all the several works.

New brickwork (see §§ 990—1)

2104. To execute according to the drawings all brick-work which will be requisite for carrying into effect and for completing the cottage with the appertenances thereof.

Chimneys

2105. To properly turn, parget, and core all the flues; to put to each of the fire-places a chimney-bar of wrought-iron 2 ins. by 2½-ins.; to put to each of the fire-places of the one-pair story, a 4-in. brick trimmer; and to put under the slab to the fire-place of the parlour upon the ground-story a fender of 4-in. brick-work 15 ins. high.

To carry up the chimney-shafts according to the drawings, and to put over each flue a large-sized chimney-pot set in tiles and Parker's cement. (*If the chimneys be with ornamental shafts, the chimney-pots may be omitted.*)

Piers.

2106. To build for the support of the sleepers of the parlour, brick piers not more than 3 ft. apart and each composed of three

courses of work 9 ins. by 4 ins., and one course of work 9 ins. by 13½ ins.; and to build under the water-butt two piers 2 ft. high 9 ins. by 18 ins., and with two courses of footings 13½ ins. by 22½. ins.

lding, &c. (See § 999.)

s-pool, &c. 2107. To stein round the cess-pool with 4 in. dry brick-work, and to put from near the water-butt to the cess-pool a barrel-drain 9-ins. bore, stuccoed over the lower half thereof with pure new quick Parker's cement, ¾ in. thick.

·ing. 2108. To consolidate properly the ground, and to pave the kitchen and the porch with 12-in. red tiles set in stone-lime mortar upon full 6 ins. in depth of coal-ashes and lime-rubbish or lime-core; the tiles in the porch are to be set diagonally with a square border of tiles round the other tiles.

tings (if any.) 2109. To cut and rub splays in the most careful and accurate manner to the brick-work round all the doors and windows, to the heads of the chimney-shafts, and to the other parts of the building, as may be requisite in order to complete the same according to the drawings.

·hes. 2110. To put to the whole of the external openings gauged arches according to the drawings, accurately cut and set quite close at the soffit and at the back.

·ings (if any.) 2111. To face the principal front and with good second malm stocks of uniform colour (or with bright malm paving-bricks, or with white bricks if the cottage be intended to ornament the estate, and be in a situation where white bricks are made.)

2112. To face all (the remainder of) the outside of the building with the best picked square stock-bricks (or red or other bricks as the case may be) of uniform colour.

2113. If the walls of the cottage be composed of common red bricks (*which from their disagreeably gaudy unarchitectural colour, so distressing to a delicate vision, should be used as seldom as possible*), such of the bricks as happen to be burnt black or bluish, may be carefully selected, and may be used in ornamenting the surface of the walls with string-courses, or with patterns of herring-bone or chequers or other devices.*

* A revival of the use of red bricks has been lately attempted, solely, as the author believes, from their gaudy colour, producing, with little trouble, some effect in a drawing which is devoid of true artistship: it is not till their colour, so uncongenial to a delicate eye-sight, has become blackened by time that they are bearable. That which affords the most favourable representation is frequently the least agreeable in reality. Thus, tattered warped and dilapidated buildings, because they are easily represented, are favourable for the sketching painter, while they are generally in reality disgusting to the mind, and cause it melancholy and uneasiness; whereas the finest and most perfect architectural objects, when represented, yield often much less pleasure than the representations of imperfect or even disgusting and dirty objects; for architectural objects requiring in their delineation the utmost precision and delicacy, are rarely done justice to: in a picture, the freshness, sobriety, and perfect condition of architecture, from the difficulty of properly representing these qualities, may please less than the representation of mud-stains and rudeness, the same as at the theatre a *clean* representation of the garments of a beggar frequently pleases more than the imaged robes of a prince. No really excellent building has ever been more than faintly represented by the painter or the engraver. (See § 778.)

Tiling (if any.) (See Index.)

½ Rods extra brickwork. (See § 1007.)

Bricks. 2114. All the bricks, except where herein otherwise directed, are to be the best new square hard well-burnt grey stock-bricks (or red kiln-burnt or other bricks, as the case may be) without admixture of soft bricks or broken or other imperfect bricks.

Mortar. (See § 1009.)

Mode of doing the work. (See § 1010.)

Jobbing-work. (See § 1011.)

MASON. (See 265—295.)

Window-sills (see § 1011.) 2115. To put to each of the windows a sill of Yorkshire (or other stone as the case may be) 9 ins. wide and 3 ins. thick, wrought with fair edges and ends, throated, and laid sloping.

Chimneys (see § 1020.) 2116. To put to the kitchen fire-place, jambs mantle and shelf, each of 2-in. Portland stone 7 ins. wide.

To put to each of the other fire-places, jambs mantle and shelf of 1¼-in. Portland stone 5 ins. wide, and a back hearth and a chimney-slab or front hearth of 2-in. rubbed Yorkshire stone.

Sink. 2117. To put in the kitchen a sink of 7-in. Yorkshire stone 2 ft. 9 ins. long and 2 ft. wide, securely fixed with the requisite bearers, and cut out to receive the waste-pipe and grate.

Steps. 2118. To put to each of the external doorways a step of solid (Yorkshire) stone 13 ins. by 7 ins., properly back-jointed and fixed upon four courses of 9 ins. brick-work.

SLATER. (See 542—3.)

Countess slating. (See § 1023.)

Nails bond, &c. (See § 1024.)

Polating (See § 1023.)

Filleting. (See § 1026.)

Reparation (See § 1025.)

CARPENTER and JOINER. (See §§ 337—40.)

New materials. (See § 1029—30.)

Timber and deal (See § 1031—2.)

CHAPTER XV.

Sundries. (See § 1033.)

Bond-timber, &c. (See § 1033.)

2119. To put all round each story of the cottage, one complete tier of fir bond-timber 4 ins. by 2½-ins. in as long pieces as possible, securely spiked together and lapped full 6 ins. at all the joins; and to put wood-bricks sufficient for fixing the finishings and other works in need thereof.

Lintels (if any). (See § 1040—1.)

One-pair flooring.

	Ins.	Ins.
2120. Wall-plate	4 by	2½
Joists	6	2¼
Trimmers and trimming-joists	6	2¼

Boarded-flooring of inch white (or yellow as the case may be) deal.

Ground-flooring.

2121. Sleepers of English oak	4½	3
Joists...	4	2

Boarded flooring of 1¼-in. yellow deal listed free from sap-wood.

Roof.

2122. To construct the roof according to the drawings with

Wall-plates...	4	3
4 Tie-beams	8	3
Angle-ties, each 4 ft. long	4	2½
Dragon-pieces	4	2
Rafters	4	2
Ridge and hips (rounded if covered with lead) ...	8	1

Fascia and eaves'-soffit (if any) of ¾ in. yellow deal tongued.

Quartered-partitions. (If any see § 1050.)

Framed deal partitions. (If any see Index.)

Doors, &c.

2123. To fit up the external front or principal entrance-doorway with a fir proper door-case 5 ins. by 4 ins. and a four-panel bead-flush and square framed door, hung with 4 in. butt-hinges two 10 in. rod-bolts and a 10 in. iron rimmed draw-back lock with strong brass furniture.

2124. To fit up the back door-way of the house, and the door of the privy, with fir proper door-cases 4 ins. by 4 ins. and ¾ in. deal wrought beaded grooved cross-tongued and ledged doors, hung with 18 in. cross-garnet hinges and Norfolk thumb latches; and to put to the back-door two 10 in. rod bolts and to the privy door a small bolt.

2125. To put to the closet deal stops and 1½-in. four-panel square framed doors, hung each with a pair of 3 in. butt-hinges and a strong 4 in. closet-lock with brass escutcheon.

2126. To fit up all the remainder of the door-ways with 1½-in. four-panel square framed doors hung each with a pair of 3½-in.

butt-hinges and a good 7 in. iron rimmed lock with key and plain strong brass furniture.

Door-linings. 2127. To put to the doors the requisite linings of 1¼-in. yellow deal single-rebated.

Windows. 2128. To fit up the front windows of the cottage with 1¼-in. yellow deal ovolo sashes double-hung with large patent lines iron weights iron axle-pulleys and spring fastenings in deal cased-frames with oak sunk sills.

2129. To fit up all the remainder of the windows with 1¼-in. chamfered-bar sashes part fixed and part hung with hinges and fastenings in solid fir chamfered frames 4 ins. by 4 ins. with framed and chamfered muntins 4 ins. by 3 ins. oak sunk sills 4 ins. by 3 ins. and wrought-iron saddle-bars ½ in. square and casements of wrought-iron with frames 1 in. by ½ in. saddle-bars hinges and proper fastenings complete.

Window-linings. 2130. To put round all the windows, inch yellow deal tongued and beaded linings.

Shutters. 2131. To put to all the windows of the ground-story inch yellow deal beaded cross-tongued and ledged shutters with rule-joints hung with strong hinges and with oaken mitred bars.

Skirtings (if any). 2132. To put to all the wood partitions skirtings of ¾ in. yellow deal 8 ins. high.

Closet-fittings. 2133. To put in each closet a shelf of inch deal as large as the closet will admit.

Angle staves. 2134. To put to the projecting angles of all the chimney-breasts proper rebated angle-beads.

Dresser. 2135. To put in the kitchen a dresser, with 1¼-in. clean deal top cross-tongued ¾ in. deal pot-board, framed legs and bearers, two drawers of ¾ in. deal rims and bottoms and inch deal fronts, two standards of inch deal, and three framed and sunk shelves of inch deal 8 ins. average width.

Stair-case. (See § 1065.)

Privy. (See § 1067.)

20 ft. extra fir timber. (See § 1071.)

Jobbing-work. (See § 1070.)

PLASTERER.

L. P. F. S. 2136. To lath, plaster, float and set ceilings and strings to the whole of the building and to the privy; and to lath, plaster, float and set all the quartered-partitions (*if any*).

2137. To render and set the whole of the internal brick-work of the cottage and of the privy, except that of the outhouse or scullery.

2138. To whiten all the ceilings and the strings of the stairs. To lime-whiten twice the internal brick-work of the out-house or scullery.

r. 2139. To teint of stone-colour in distemper the whole of the plastering of the sides of the cottage and of the privy.

cement. 2140. To put all round the brick-work of the whole of the rooms, closets, and other plastered parts of the cottage, skirtings of Parker's cement 8 ins. high and one inch thick.

2141. To execute according to the drawings with Parker's cement stucco, the mouldings round the chimneys and round the eaves of the cottage (*if any*).

2142. To cover (*if so intended*) the whole surface of the fronts and of the cottage with the best Parker's cement stucco with all the arrises, splays, reveals, and strings (*if any*) correctly executed.

2143. To form the rustic-quoins, labels, window-cases, door-cases, and (*if any*) in Parker's cement stucco according to the drawings.

2144. The whole of the external stucco is to be jointed in imitation of stone, is to be roughly coloured in small pieces while yet soft, and is to be afterwards wholly teinted of stone-colour. (See § 1845.)

PLUMBER.

-gutters. 2145. To lay the chimney-gutters with 6 lb. milled-lead 18 ins. wide, and to put thereto flashings of 4 lb. milled-lead 5 ins. wide.

idges and 2146. (*If any.* See § 1631.)

uttering. 2147. To put to all the eaves 4-in. cast-iron trough-guttering put together with white-lead, and securely fixed upon sufficient strong wrought-iron brackets.

2148. To provide and fix from the eaves'-guttering to the water-butt a complete stack of 3-in. cast-iron rain-water-pipe with proper head and shoe.

utt. 2149. To provide and fix in the garden against the cottage a strong sound and good wine-pipe to serve as a water-butt, and to put thereto $\frac{3}{4}$-in. lead pipe leading from the water-butt to the sink, and to put to the water-butt two good brass cocks, one to draw water at the sink, and the other to draw water in the garden.

Sink.

2150. To put to the sink a strong 2-in. lead waste-pipe with a brass bell trapped grating.

GLAZIER.

2151. To glaze all the windows and lights with good second Newcastle glass, that to the front windows properly bedded, bradded, and tack-puttied, and all the remainder of the glazing fixed in strong lead-work with copper-bands.

2152. To clean and leave perfect all the glazing at the rendering up of the works as complete.

PAINTER. (See § 1085—6.)

CHAPTER XVI.

SPECIFICATION FOR ERECTING *and completely finishing* A COTTAGE, *with out-buildings thereto*, FOR A MARKET-GARDENER, *at* , *for* , *according to the Drawings attached to and forming part of the contract, and according to such further explanatory detail drawings as may be hereafter given.*

(Insert here list of Working-drawings. See § 986.)

BRICKLAYER.

Take down old buildings. Stack up materials.

Clear away rubbish, &c.

2153. To take down the present house and the out-buildings thereof; to clean all the sound bricks therein; to sort, set apart, and stack up for use, all the materials fit to be again used; and to remove to such part of the premises as may be by the Surveyor directed, all the rubbish and useless materials rejected from the old buildings, and all the rubbish which may arise from the execution of all the several works of the intended new buildings.

Digging (see §§ 988 and 1229.)

2154. To dig out the ground for the foundations and other works of the intended new buildings, and to fill in again and dispose of the ground to the levels shown by the drawings.

General brickwork.

2155. To execute all brickwork requisite for carrying into effect the buildings according to the drawings, and to complete the buildings in every respect.

Chimneys.

2156. To properly turn, parget, and core all the flues; to

put to the parlour fire-place a 4-in. brick fender 12 ins. high, in order to support the chimney-slab; to put to each of the chamber fire-places a 4-in. brick trimmer 12 ins. longer than the chimney-opening; to carry up the chimney-shafts according to the drawings with the flues detached from each other, and with the upper four courses thereof set in Parker's cement; and to lay to each fire-place on the one-pair story a foot-pace of paving-tiles.

Gauged arches.

2157. To put to the back and front door-ways of the house guaged-arches 8 ins. on the face chamfered at the edges, and properly set. (See §§ 358 and 570—594.)

Splays, &c.

2158. To cut and rub splays to the lower plinth, round the windows and doors, and to the projecting parts of the chimney-stacks, and to finish the same as shown by the drawings.

Bedding.

2159. (See § 999.)

Piers, &c. under ground-floor.

2160. To put brick piers 3 courses high and 9 ins. by 4 ins. not more than 3 ft. apart to support the sleepers of the ground-story, and to put 12 feet run of 4 ins. brickwork 18 ins. high next the wood flooring to complete the closet, &c. under the stairs.

Bricks.

2161. In the performance of the brick-work the contractor is to be allowed to use when properly cleaned such of the present old bricks as remain sound, but he is to find sufficient new sound hard-burnt square grey stock-bricks of a good bright colour for facing all the external work of the principal building, and for making up all deficiency which may be found after laying aside the useless old bricks.

Mortar.

2162. The whole of the mortar to be used in the work is to be compounded in the proportion of one third by measure of the best stone-lime and two thirds by measure of clean sharp (*Thames*) sand properly worked and beaten up together.

Mode of doing the work.

2163. (See § 1010.)

Cess-pool.

2164. To dig out for the privy, and stein round with 4-in. dry brick-work, a cess-pool 2 ft. 6 ins. diameter, and 8 ft. deep, internal dimensions.

aving.

2165. To pave the kitchen, the closet under the stairs, the part between the same closet and the kitchen, and also the wash-house and the back-porch, with the present sound old paving-bricks of the present building, and such new bricks similar thereto as will be required for making up the deficiency.

ne whiting and ouring.

2166. To lime whiten twice the internal brickwork of the privy and of the wash-house; to colour stone-colour the outside of the lean-to building, and the outside of the stable-buildings.

ling.

2167. To cover the principal roof of the dwelling-house with the best well-burnt plain-tiles on strong heart of fir double laths; and to cover the lean-to roof of the wash-house, and the roofs of the stable and cart-shed, with pan-tiles. Note that such of the tiles of the present building as may turn out sound and undecayed,

may be used in the new building, but all deficiency therein is to make up with new sound tiles, the whole of the ridge-tiles and hip-tiles are to be secured by T nails, and the hips are also to have proper wrought-iron hip-hoops. The T nails and hip-hoops are to be dipped in melted pitch.

MASON. (See § 265—295.)

Sills. (See § 1042.)

2168. To put to all the windows, sills of 2-in. Yorkshire stone 9 ins. wide, set sloping and tooled fair.

Front doorway step, and 1 water-tabling

2169. To put to the front doorway of the house a step of solid Yorkshire stone 12 ins. by 7 ins., rounded at the ends thereof, and to finish the small gable of the entrance with Portland stone water-tabling and finial according to the drawings.

Sink

2170. To put in the wash-house a sink 2 ft. by 2 ft. 9 ins. of Yorkshire stone 7 ins. thick, cut out for the grate and waste-pipe, and fixed complete.

Chimney pieces

2171. To put to the kitchen fire-place jambs and mantle of 1¼-in. Portland stone 7 ins. wide; to put to the fire-places of the parlour and chambers 1-in. Portland stone jambs mantles and shelves 5 ins. wide.

Slab

2172. To put to the parlour fire-place a slab of 1¼-inch Portland stone 18 ins. wide.

Bases for posts

2173. To provide and fix six Yorkshire stone bases for the heel-posts of the stable and the story-posts of the cart-shed, each to contain one foot cube, and properly tooled and mortised.

CARPENTER and JOINER. (See §§ 337—40.)

Materials &c.

(See § 1029.)

Timber and deals.

(See §§ 1031—2.)

Bond timber (see § 1038)

2174. To put one complete tier of bond-timber 4 ins. by 2½ ins. round the walls of the dwelling-house, wash-house, and stable-building, at the heights shown by the drawings.

Wood-bricks.

(See § 1039.)

Lintels, &c (see § 1041. The building being detached, and not in a country containing quarries, wood may be used for the purpose here stated.)

2175. To put to 13 of the external openings and recesses, or wrought and chamfered lintels each scantling 6 ins. by 4 ins., and 12 ins. longer than the clear opening; to put over the lintels of the 5 front windows, mitred labeled mouldings, as shown by the drawings. To put the requisite other lintels and filling-in-lintels scantling 4 ins. by the necessary width; and to put all requisite templets.

Centering and sundries. (See § 1033.)

2176. To provide all centering requisite for turning the arches and trimmers; and to provide all requisite fillets, beads, stops, blocks, and linings; and to perform such rebating, beading,

grooving, tonguing, and other labour as may be necessary to the work and the complete finishing thereof.

&c.

	Ins.	Ins.
2177. Wall-plates	4	by 2½
Rafters to the stable-building and to the cart-shed ...	3½	— 2
All the other rafters	4½	— 2
Purlins to the stable-building and cart-shed	6	— 4
Two struts to ditto	3	— 3
4 angle-ties each 8 ft. long to ditto	4	— 2
Ridges and 4 short hips	8½	— 1¼
1-in. deal chimney-gutters on proper bearers.		
Ceiling-joists 7 ft. long saddled to each pair of rafters of the dwelling-house	3	— 1¼
2 wrought and framed breast-summers to the roof of the cart-shed	8	— 6
4 wrought and framed posts to ditto	8	— 4
A pair of ¾-in. deal proper ledged gates the whole height of the cart-shed hung with ironmongery, value £2.		

ID FLOOR.

r front ce and

2178. Old (*or new, as the case may be*) oak joists...	3½	by 2
Old (*or new, as the case may be*) oak sleepers	3	— 3
Inch yellow deal floor listed free from sap-wood.		

loors.

2179. Wall-plates	4	by 2½
Joists to the principal building	6	— 2
Ditto to the stable-loft	4	— 2
Trimmers each one inch thicker.		
2 binders to the stable-loft	9	— 4
2 heel-posts under ditto, framed wrought and chamfered	4	— 4
The flooring to be laid with new inch white deal.		

se. (See)

2180. To fit up beneath the stair-case, a closet with inch deal and half-inch deal board and braced spandril-partition with one of the present old doors repaired and re-hung therein with proper stops and a button.

quare- partitions ors.

2181. To inclose the rooms by 1½-in. square framed partitions and doors according to the drawings; each door is to be hung with a pair of 3-in. butt-hinges and a 6-in. good iron rimmed lock, and is to have beaded door-stops round the same.

loors.

2182. To put to the front entrance an inch proper ledged door, hung with ironmongery value 15 shillings, in a wrought and chamfered door-case 6 ins. by 4 ins. with a Gothic head thereto and a riser beneath the threshold. To put to the back porch and to all the other door-ways new ¾-in. proper ledged doors, the whole thereof hung with the requisite new hinges; the large stable-door, the loft-door, and one of the wash-house doors are to have 9-in. rough rod-bolts; the other doors of the stable and wash-house are to have 7-in. stock-locks; the privy-door is to have a small bolt, and the back entrance-door is to have two 9-in. bright rod bolts.

Door-cases and linings.

2190. To put in proper door-cases 4 ins. by 4 ins. and 1¼-in. rebated door linings where requisite, and as shown by the plans.

Closet.

2191. To put up a closet in the kitchen with 1¼-in. square framed [illegible] and hang the door [illegible] with 3-in. butt hinges and [illegible] and the lower part up to the inside thereof with [illegible] of inch deal shelves the depth of the closet.

Skirtings.

2192. To [illegible] the parlour, the entrance-passage, the two [illegible] and the upper flight of stairs with ¾-in. deal 4½ ins. [illegible] the walls.

Windows.

2193. To [illegible] the windows with 1½-in. ovolo sashes double-hung with [illegible] and weights, large patent lines, and [illegible] in deal case-frames with English oak sunk [illegible].

Shutters.

2194. To [illegible] the windows of the parlour and kitchen with inch clamped shutters hung with strong hinges and fastenings; and to [illegible] the wash-house one of the present old shutters prepared, altered, adapted, and made complete.

Dresser.

2195. To put in the kitchen a dresser with shelves and fittings complete value 3*l*.

Privy.

2196. To [illegible] up the privy with inch deal seat and riser and [illegible].

Stable.

2197. To [illegible] up the stable with 3-in. deal chamfered moveable [illegible] 4 ins. wide, 3 wrought-iron hay-racks, inch deal mangers with grooved and chamfered oak top-rails 3½ ins. by 2½ ins. and fixed on strong bearers; and to provide a step-ladder to lead through a well-hole into the loft.

Iron work. See § 1703.

2198. To put to each of the fire-places on the ground-story a chimney-bar of wrought-iron 2 ins. by ⅝-in.; to provide and fix where directed 224 lbs. of wrought-iron in straps, ties, and bolts.

PLASTERER.

Lath, plaster, set, and whiten.

2199. To lath, plaster, set, and whiten ceilings and strings to the whole of each story of the dwelling-house, the wash-house excepted.

Render and set.

2200. To render and set the whole of the internal brick-work of the dwelling-house, that to the wash-house parlour and privy excepted.

Parker's cement skirting.

2201. To put round the walls of the kitchen a skirting of Parker's cement nine inches high.

PLUMBER.

2202. To lay the chimney-gutters with 5 lb. milled-lead 18

ins. wide ; to put to the sink a grate and a 2-in. waste-pipe bent to form a trap ; to remove, repair, re-fix in the wash-house, and make complete the pres et pump.

GLAZIER.

2196. To glaze all the windows and lights with good fourth crown glass, and using for the inferior windows such of the present glass as may turn out applicable to the same ; and to clean and leave perfect the whole of the glass at or immediately before the whole of the works are rendered up as complete.

PAINTER.

2197. To knot, stop, prepare properly, and paint four times in the best oil-colour all the wood-works and other works of the premises usually painted, and to finish the same of such plain colours as the Surveyor may direct.

CHAPTER XVII.

SPECIFICATION FOR ERECTING *and completely finishing fit for occupation at , in the county of , a* SMALL GOTHIC LODGE *or* COTTAGE *for , agreeably to the drawings hereunder enumerated, signed with and forming part of the contract and according to the directions of the architect, and such further explanatory drawings as he may provide.*

(*Here insert a list of the Working-drawings, see* § 986.)

BRICKLAYER.

Ground-work.

2198. To level the ground over the whole site of the intended building ; to excavate the ground for all the footings and work so requiring ; to fill in again, ram down, and consolidate the ground about the new work ; and to dispose of and make up the ground with the spare earth and rubbish which will result from the execution of the intended works around the building as shall be by the architect directed.

General brick-work. (See §§ 990—1.)

2199. To execute all the brickwork which will be requisite for forming and completing the foundations, walls, chimneys, and the other parts of the lodge and its appertenances in every respect.

Rough arches.

2200. To turn rough arches and counter-arches through the entire thickness of the brick-work of the respective walls, the

centering being left up till the same is by the architect directed to be in the first instance eased and afterwards to be finally struck.

Bedding, &c. (See § 999.)

Chimneys. 2201. To properly turn parget and core all the chimney-flues; to carry up the chimney-shafts according to the drawings; to put to each fire-place on the basement-story a brick fender 9 ins. thick and 2 ft. high, in order to receive the chimney-slab; and to put to each of the other fire-places a 4-in. brick trimmer at least 18 ins. longer than the chimney-opening.

Chimney-bars. 2202. To put to each fire-place a wrought-iron chimney-bar 2 ins. by $\frac{5}{8}$ in.

Piers under kitchen-floor. 2203. To build under the kitchen-floor 16 brick piers each 9 ins. square and 9 ins. high, with a footing in addition thereto 14 ins. square and one course in height.

Drains. (See § 1001—4.) 2204. To construct feet run of barrel-drain 12 ins. bore of 4-in. brick-work, rendered over the lower half thereof $\frac{3}{4}$-in. thick with pure Parker's cement; and to perform all requisite digging ground-work and making good thereto.

To put a large stench-trap to the drain; and to put a brick funnel at the foot of each of the pipes.

Cuttings, splays, projections, &c. 2205. To prepare the outside of the brick-work with chamfers, splays, projections, and cores, proper for receiving the external stucco and decorations. (*Omit this if the decorations be of stone.*)

One rod of brick-work extra. (See § 1007.)

Bricks. (See §§ 358 and 1008.)

Mortar. (See § 1009.)

Grouting, &c. (See § 1010.)

Mode of doing the work. (See § 1010.)

Breast-wall. 2206. The breast-wall for the support of the roadway leading to the front entrance is to be built curving 4½ ins. out of the perpendicular, so as to resist the thrust of the ground.

Jobbing work. (See § 1011.)

MASON. (See §§ 265—295.)

4 in. Portland stone landing. 2207. To put to form the floor and step of the porch, a landing of Portland stone 4 ins. thick, rubbed fair on all the exposed surfaces thereof, and with a riser of stone corresponding with the landing.

Yorkshire paving to basement.

2208. To pave the whole of the basement story (the kitchen excepted) with 2½-in. Yorkshire stone paving wrought on the edges all through the whole thickness thereof, and laid in regular courses upon three courses of 4 in. brick-work, full 6 ins. space being left between the ground and the under side of the paving.

2209. To pave with 2½-in. Yorkshire stone all round the basement story of the lodge an external area 3 ft. 6 ins. in width, laid with currents to lead into the drain; and to put in the paving two five-hole sink stones.

Sink.

2210. To put in the basement story a sink of Yorkshire stone 7 ins. thick containing 10 ft. superficial, set upon the requisite brick-work and cut out to receive the waste-pipe and grate.

Chimney-pieces.

2211. To put to each of the best three rooms a marble chimney-piece with slab hearth and fixing complete value 7*l*.

To put to the kitchen fire-place 2 in. Portland stone jambs mantle and shelf each 7½-ins. wide, and a rubbed Yorkshire stone hearth containing 20 ft. superficial.

To put to all the remainder of the fire-places, inch Portland stone jambs mantles and shelves each 5 ins. wide, 1½-in. Portland stone chimney-slabs 1 ft. 6 ins. wide and 12 ins. longer than the chimney-opening and rough 2½-in. Yorkshire stone hearths.

Coping of breast-wall.

2212. To cover the breast-wall with 3-in. Yorkshire stone 13 ins. wide, with chamfered edges, and throated and plugged with lead at all the joints therein.

SLATER. (See § 542—3.)

Countess slating.

(See § 1023.)

Bond nails, &c.

(See § 1024.)

Reparation.

(See § 1025.)

CARPENTER AND JOINER. (See §§ 337—40.)

Materials, &c.

(See §§ 1029—30.)

Timber and deals.

(See §§ 1031—2.)

Iron-work. (See § 1703.)

2213. To provide and fix 4 cwt. of wrought-iron in such stirrups, screw-bolts, ties, and other work as may be directed, and to deliver vouchers for the same to the architect.

Sundries.

(See § 1033.)

Bond-timber and wood-bricks. (See §§ 1036—8.)

2214. To put all round in the brick-work of the ground-story three tiers of fir bond-timber 4 ins. by 2½ ins.; to put all round in the brick-work on the one-pair story two tiers of similar bond-timber, and to put in the gable-walls one additional tier of similar

bond-timber. The whole of the bond-timber is to be properly lapped and spiked.

To put in the brick-work such wood-bricks as may be requisite for fixing the various finishings.

Centering. (See § 1141.)

Lintels. (See § 1041.) 2215. To put the requisite fir lintels over the various openings, each lintel being in scantling 4 ins. by the breadth of the wall, and 15 ins. longer than the opening.

Battening. 2216. To batten all the external brick-work of the ground-story and one-pair story, with inch yellow deal battens 2 ins. wide and not more than 12 ins. apart.

Kitchen-floor. 2217. To lay to the kitchen a floor of $1\frac{1}{4}$-in. yellow deal listed free from sapwood, with fir joists $4\frac{1}{2}$ ins. by $2\frac{1}{2}$ ins. upon oak sleepers 4 ins. by 3 ins.

One-pair and two-pair floors.

2218.		Ins.		Ins.
Wall-plates		4	by	4
Joists		9	—	$2\frac{1}{4}$
Trimmers and trimming-joists		9	—	3

One tier of herring-bone struts to each floor.

Inch yellow deal floors of half-boards listed, free from sap-wood.

Roof. (See §§ 411, 430—448, and 520—550.)

2219.				
Wall-plates	6	by	4	
Principal rafters, at top 6 ins. by 5 ins., at bottom ...	8	—	5	
Tie-beams	9	—	5	
Braces	5	—	$2\frac{1}{2}$	
Purlins	6	—	4	
Ridges rounded for lead	$1\frac{1}{4}$	—	$8\frac{1}{2}$	
Common rafters	$3\frac{1}{2}$	—	2	
Ceiling-joists	3	—	2	
Valley-pieces	6	—	3	

Inch slate-battens $2\frac{1}{2}$ ins. wide.

Joists to the flat over the porch	4	—	2

Inch yellow deal boarding for lead to ditto with proper furrings, and currents the same as to gutters.

Verge or barge-boards and pinnacles. 2220. To fit up the three gables with pierced ornamental barge-boards of 2-in. deal and solid framed pinnacles according to the drawings at large, the whole of the barge-boards and pinnacles fixed in the most secure manner, and made complete.

Quartered partitions. (See §§ 544—50 and 1051—2.)

2221.			
Heads and sills	4	by	$3\frac{1}{2}$
End-posts, door-posts, and door-heads	4	—	3
Braces (or struts)	3	—	3
Quarters	4	—	$2\frac{1}{4}$
Two tiers of inter-ties to each story	3	—	$1\frac{1}{4}$

Framed deal partition. 2222. $1\frac{1}{4}$-in. deal framed flush and canvassed on both sides to receive papering.

Skirting. 2223. To skirt the best three rooms with inch plinth $10\frac{1}{2}$ ins.

high, and gothic mouldings 4½ ins. girth, fixed upon ploughed grounds and with proper backings.

To skirt the remainder of the building above the basement-story with inch deal 8½ ins. high, chamfered and plugged.

indows. 2224. To fit up all the windows as shown by the drawings with solid fir moulded gothic frames, with oak sunk sills, and 1½-in. gothic moulded sashes, in part fixed and in part hung as casements with 3 in. butt-hinges and brass pulpit-latches.

The bay-window is to be roofed over with wall-plates 4 ins. by 4 ins. rafters 3 ins. by 2 ins. and inch yellow deal boarding.

To fit up all the windows with inch deal tongued and beaded linings.

xternal doors. 2225. To fit up the external door-ways with fir proper door-cases 5 ins. by 4 ins. with oak sills and 2 in. sashed doors framed bead-flush on both sides; each door is to be hung with three 4 in. butt-hinges and is to have inch tongued and beaded door-linings, an 1¼-in. bead-flush and square shutter with dogs and thumb-screw, and in addition thereto lock and bolts of the value of 15*s.* to each door.

:ternal doors. 2226. To put to the best three rooms 2 in. four-panel doors moulded on both sides, and hung with 4 in. butt-hinges and best mortise-locks with brass furniture; and to put to all the remainder of the door-ways and closets 1½-in. four-panel square framed doors, hung with 3 in. butt-hinges and the best 7 in. iron rimmed locks with brass furniture.

oor-linings, :. &c. 2227. To put to all the internal door-ways 1¼-in. single rebated linings, and inch deal framed and chamfered grounds 4 ins. wide with Gothic mouldings thereon 3 ins. girth.

aircase. 2228. To construct the stair-case according to the drawings, with 1¼-in. clean deal steps landings and risers securely fixed upon very strong bracketed fir carriages, 1½-in. deal wall-strings and beaded outer string-boards: the stairs from the ground floor upwards are to have returned moulded nosings with curtail-step.

To fit up the stair-case with all requisite inch deal apron and other linings and bearers, strong framed and turned newels, square bar balusters (every tenth baluster being of wrought-iron) deal moulded hand-rail with mitred cap to the basement stairs, and from thence upwards Spanish mahogany moulded hand-rail with scroll and ramps.

:esser. 2229. To put in the kitchen a dresser with shelves drawers and fittings complete value fixed 6*l.*

»sets. 2230. To fit up each of the closets all round with three tiers of inch shelves 10 ins. wide fixed upon bearers complete.

ft. cube extra (See § 1071.)

. fittings. 2231. To provide under the contract such further fittings in value 10*l.* as the architect may direct.

PLASTERER.

[illegible]

2232. To [illegible] plaster, float, set, and whiten ceilings and strings to the whole of the lodge.

[illegible]

2233. To [illegible] plaster, float, and set the fretted work of the interior of the lodge.

[illegible]

2234. To render, float, and set the brick-work of the basement-story, and of the unfretted parts of the ground-story and one-pair story.

Chimney

2235. To colour the sides of the basement-story of a tint of stone colour.

Cornice

2236. To run round the west rooms on the ground-story Gothic cornices 15 ins. girth.

Arches, architraves &c

2237. To execute in troweled stucco the jambs and arches leading to the bay-windows; and to execute to the plastering all requisite arrises, beads, and quirks.

Parker's cement Colour

2238. To put all round every part of the basement-story skirting of Parker's cement, one inch thick and 9 ins. high, tainted stone colour.

[illegible] the [illegible] [illegible] [illegible] [illegible] [illegible]

2239. To execute in the best manner with Parker's cement stucco jointed to imitate masonry, the whole of the exterior of the lodge, with its cornices, plinths, strings, mouldings, labels, jambs, reveals, chimneys, decorations, embellishments, and appurtenances of every kind, according to the drawings, profiles, details, and directions of the Architect; the work is to be roughly coloured as soon as any portion thereof is done, and is to be finally completely coloured when the Architect shall direct, with weather-proof colouring fixed with Russia tallow, beer-grounds, tar, and the other proper ingredients.

Chimney shaft

2240. To put over each flue a decorative chimney-shaft, value two guineas, of such pattern as shall be approved of by the Architect.

PLUMBER.

[illegible] milled lead [illegible]

2241. To cover the ridges with 4-lb. milled-lead 16 ins. wide properly secured.

[illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

2242. To lay the valleys, the chimney-gutters, and the flat over the porch, with 6-lb. milled-lead turned up at least 6 ins. at the sides thereof, and with 4-lb. milled-lead flashings 5 ins. wide let into the brick-work.

[illegible] [illegible] [illegible] [illegible] milled [illegible]

2243. To cover the bay-window with sheet-copper weight 16 oz. to the foot superficial, dressed to the form of water-tablings, and painted stone colour.

Waste-pipe, &c.

2244. To put to the sink in the basement-story a 2-in. strong lead waste-pipe to lead into the drain, and a large brass bell grate.

R. W. P. and gutters.

2245. To put to the eaves of the lodge 3-in. cast-iron troughs jointed with white-lead, fixed on strong wrought-iron brackets complete; and to put from the eaves'-troughs to the area two stacks of 2½-in. cast-iron rain-water-pipe and one stack of 3½-in. rain-water-pipe fixed with Gothic heads and shoes complete.

PAINTER.

4 times in oil.

2246. To knot with silver leaf, stop, pumice smooth in every part, prepare properly, and paint four times with the best oil colour, all the wood-work, iron-work, and other works of the lodge and of its appertenances which usually are painted.

Wainscot imitation.

2247. To grain in the best manner in imitation of wainscot, (or old oak,) and varnish twice with strong copal, the whole of the external wood-work of the lodge.

GLAZIER.

Best glass.

2248. To glaze the windows of the best three rooms and the door of the front entrance with the best Newcastle crown glass.

2nd glass.

2249. To glaze all the remainder of the windows and lights with good second Newcastle crown glass.

Cleaning, &c.

2250. The whole of the glass is to be properly bedded, bradded, and back-puttied, and is to be cleaned and left perfect at or immediately before the final rendering up of the lodge as complete.

PAPER-HANGER.

2251. To prepare, underline, and hang with figured paper value 6*d.* per yard, with border at top and bottom value 1½*d.* per yard, the whole of the ground-story and the whole of the one-pair story of the lodge, including all the closets thereto attached.

CHAPTER XVIII.

SPECIFICATION *for erecting and entirely finishing a new* ENTRANCE GATEWAY *to a* NOBLEMAN'S PARK, *with a* PORTER'S LODGE *thereto attached, from the drawings appended to and forming part of the contract, under the direction of the Architect thereof, and according to such further explanatory detail drawings as may be by the said Architect hereafter given.*

(Insert here list of Working-drawings, § 986.)

BRICKLAYER.

Digging, cartage, &c.

2252. To level the ground forming the site of the intended building; to dig out for all the foundations and other works according to the drawings and as occasion shall require; to cut all the trenches level and render the beds thereof hard and solid; to fill in the earth again and ram the same down after the foundation-works are completed to the levels shown by the sections; to cart away all the superfluous earth and all rubbish which may from time to time accrue in or about the building from the several works, and to leave the ground and premises finally clear therefrom.

General brick-work.

2253. To execute all brick-work requisite for forming the foundations and walls, and for carrying into effect the design of the building according to the drawings; and to execute also all brick-work which may be requisite for rendering the whole of the gateway and lodge in every respect complete.

Rough arches, dome, &c.

2254. To turn rough arches and counter-arches (wherever the same can be put) through the entire thickness of the brick-work of the respective walls, the centering in every case being left up till directed by the architect to be in the first instance eased and finally struck, after which the brick-work is to be filled in (where there are recesses) up to the soffits of the arches; and to fill up the spandrils of the domed work with solid brick-work to the height shown by the sections.

Bedding, &c.

2255. To bed in mortar the plates, lintels, bond-timber, wood-bricks, door-cases, window-frames, and all the other things in or about the building which may so require; and to fill in to and back up in a solid manner the brick-work to all the mason's work.

Chimneys.

2256. To properly turn, parget, and core all the flues, to put to each fire-place on the ground-story a brick fender 9 ins. thick and 2 ft. high to support the slab; and to put to each of the other fire-places a 4-in. brick trimmer at least 18 ins. longer than the chimney-opening.

[redacted]

APTER XVIII.

under id-floors.

2257. To build 48 brick piers to support the ground-flooring, each 9 ins. square and 9 ins. high, in addition to a footing 13½ ins. square and one course of bricks high.

ns. (See)

2258. To construct a barrel-drain 18 ins. bore of 4-in. brick-work, stuccoed over the lower half thereof with pure quick Parker's cement one inch thick, as shown in the plan of the foundations, and to continue the same drain so as to unite with the main drain running from , and to put a brick shoot thereto from each of the soil pipes and rain-water pipes.

s of brick in addition.

(See § 1007.)

ns.

(See § 1008.)

ar.

(See § 1009.)

ting, &c.

(See § 1010.)

: of doing the , &c.

(See § 353—365, and 1010.)

: good in- re-wall.

To make good to the new building in a workmanlike manner the park inclosure wall where the same will adjoin to the lodge.

ilding.

2259. To provide, erect, maintain, alter as occasion may require, and finally remove, sufficient safe standing scaffolding for the execution of the mason's work, and all scaffolding which will be requisite for the execution of the brick-work, and for the execution of all the other works of every kind of the whole building, with cords, ropes, wedges, tackle, ladders, boards, planks, and all other appertenances proper and necessary thereto.

MASON. (See §§ 265—295.)

rses of 3-in. shire stone ndation.

2260. To provide and lay beneath the brick footings of the whole building, two complete courses of 3-in. self-faced Yorkshire stone of the several widths shown by the plan and sections and the dimensions figured thereon, each stone thereof to average in quantity 10 ft. superficial, and no stone thereof to contain less than 6 ft. superficial; the whole to have the joints close and crossed in the courses upon each other as much as possible.

ite plinth by 8 ins.

2261. To put all round the exterior of the building and along both sides of the great archway, a chamfered plinth of Aberdeen granite 2 ft. by 8 ins. tooled fairly at the front top ends and joints thereof, and plugged with lead; the four pieces of the plinth adjoining to the lodge outer-doors are to be mitred and worked in two faces as shown by the drawings.

and stone moulding.

2262. To put the base-moulding above the granite plinth, formed of Portland stone 12 ins. by 9 ins. cramped at all the joints with strong copper T cramps 14 ins. long, weight each 12 oz. and run with lead: the base-mouldings of the eight turrets are to be each in one single stone.

Portland stone niches.

2263. To form the four niches including the architraves and other decorations thereof, according to the drawings, entirely of solid Portland stone.

Portland stone piers, arches, &c.

2264. To form of Portland stone the four piers of the great gateway and the two large foliated arches and two circumscribing square architraves thereof, with all the carving, scrolls, finials, and other decorations according to the drawings.

Portland stone window-cases.

2265. To form of Portland stone the two large window-cases at the East and West ends of the lodge including the foliated arches and the architraves thereof.

Portland stone turrets.

2266. To form the eight turrets of solid Portland stone in alternate courses, as shown by the drawings; the four lanterns crowning the turrets are to be worked fairly on the inside thereof, and the small domes over them are to be of solid Portland stone; the shafts and finials of the turrets are to be secured by copper plugs, and also by copper spindles 1½ in. diameter.

Dome. (See §§ 329, 349, and 380.)

2267. To construct the dome immediately over the gateway of solid Portland stone 9 ins. average thickness fluted upwardly from the four angles in the manner shown by the drawings and plugged with lead at every joint therein. (*Note. This dome might be made of brickwork or of hollow pots.*)

Curb to dome.

2268. To put round the opening in the stone dome the circular curb of Portland stone to hold 1 ft. 4½ ins. by 2 ft. 3 ins., cut to form pendants and run with lead at all the joints therein; to provide, let in at the top of the curb, and run all over with lead, a copper chain-bar ¾ in. by 1½ in. with couplings complete.

To put also beneath the lower plate of the upper dome a Portland stone curb 12 ins. by 9 ins. when finished, and twelve large Portland-stone leaf brackets, carved and wrought according to the drawings.

6-in. covering of Yorkshire stone.

2269. To form the flat over the gateway of 6-in. Yorkshire stone landing in only four slabs, joggled together and run with lead, laid with currents to the two rain-water-pipes, and worked inside to form a circular cornice according to the profile. (*Yorkshire stone was in this instance chosen* on account of its tenacity, but its liability to fracture by frost is an objection from which Craigleith and some other kinds of stone are free.)

Strings, cornices, &c.

2270. To provide and fix all the strings, cornices, and other mouldings and decorations of Portland stone with projections as shown by the drawings, and run with lead.

Pierced battlements.

2271. To construct the pierced battlements round all the parapets, according to the drawings, of Portland stone 6 ins. thick, in as few pieces as possible; and to continue a similar battlement round the circular opening in the stone dome.

Carving.

2272. To perform in an artist-like manner, to the satisfaction of the Architect, the carving of the pendants, battlements, foliated arches, finials, six crests, four small domes, and of every other part of the building.

CHAPTER XVIII.

Modeling. 2273. To provide models to the approbation of the Architect, made by an artist in London, for all the carving of every kind of an entire turret from the foot of the pierced battlement, upwards: the whole to be made to a scale of 3 ins. to one foot.

Chimneys. 2274. To provide and fix the six ornamental chimney-pots according to the drawings, formed of solid Portland stone without joints.

Inscriptions. 2275. To cut the inscriptions round the four sides of the building, beneath the pendent cornice, as follow: "————."

Portland stone ashlar, &c. 2276. To face with Portland stone all the remainder of the external surfaces of the walls, including the sides of the great gateway, with ashlaring, consisting as nearly as circumstances will admit of stones 3 ft. long and 4½ ins. bed, alternately with bond-stones 1 ft. 6 ins. long and 9 ins. bed; the bond-stones are to be secured to the brick-work by two strong 12-inch copper cramps weight 8 oz. to each, and the other stones are to be secured thereto by being let at their ends dovetail-wise one inch thereinto, and by being plugged at top and bottom into the alternate bond-stones by copper plugs. The bond-stones are mostly distinguished in the elevations by a light teint of blue.

teps. 2277. To put to each of the lodge external doorways a step formed of square parallel granite curb 12 ins. by 8 ins.

granite sills. 2278. To form two sills across the great archways, of Aberdeen granite, each in three pieces joggled together and run with lead, the centre piece of each sill is to be 12 ins. by 8 ins., and the end pieces are to be 12 ins. by 12 ins.

tenings, &c. he gates. 2279. To let in the iron-work of the great gates, under the directions of the carpenter.

ing. 2280. To form a footway on each side of the gateway, and to the extent shown by the plans, of 3-in. Yorkshire stone in regular courses, and with parallel square Aberdeen curb 12 ins. by 10 ins. close jointed and joggled together.

dway. 2281. To form the roadway to the extent shown by the plan, by excavating the ground 2 ft. deep, and filling up the space so excavated with broken flints and broken granite in pieces not more than one inch square.

osure-wall. 2282. To make good to the new building in a workmanlike manner the stone-work of the inclosure-wall of the park adjoining to the lodge.

ney-pieces, 12*l*. 2283. To provide and fix in the lodge four Portland-stone chimney-pieces with hearths, slabs, and fixing complete, of the aggregate value of £12.

e. 2284. All the stone is to be of the very best quality, free from shakes, vents, and all other defects; the whole of the stone is to be laid in the building so as for the compression thereof to be in the natural way of the quarry-beds.

Joints to

2283. The joints of the stone-work are to be placed in [illegible] where they are shown in the drawings by blue lines; the [illegible] of the gateway and turrets are to be cut so as to rise the [illegible] courses of brick-work, except where otherwise [illegible] the angles of the angle-joints and level beds of the stone-work where they occur over other stones is to be set in 6-lb. [illegible] covering the entire site of the stone except one inch [illegible] the outside where the joint is to be pointed with stone-lime [illegible]

[illegible]

2284. The contractor is to provide lead for the cramps and [illegible] and is also to provide and fix the requisite copper cramps [illegible] and bolts of lead are to be used in any part of the [illegible] he is also to cut all requisite rebates, grooves, chases, [illegible] for the fire-edges, and to perform the other labour [illegible] necessary to mason's work.

Repairing stone-work after completion of the building.

2285. The whole of the work is to be warranted finally perfect and [illegible] any damage occur thereto by reason of frost within twenty-six calendar months after the completion of the building, all such damage is to be made good at the Contractor's expense as the Architect shall direct: the whole of the mason's work is to be cleaned off when directed, shortly prior to the entire completion of the building.

CARPENTER and JOINER. (See 337—40.)

Note—[illegible]

(See [illegible] 129—30.)

Preservative [illegible]

(See [illegible] 131—2.)

Hoarding

2288. To erect and maintain sufficient substantial hoarding [illegible] the building during the performance of the works, and to remove the same when so directed.

Bond-timber and wood-bricks. (See § 5.)

2289. To put all round the internal brick-work of the building three tiers of fir bond-timber to each story thereof, scantling 4 ins. by 2½ ins., the whole without joints except at the angles; and to put such wood-bricks as may be requisite for fixing the various finishings and other works in need thereof.

Lintels

2290. To put the requisite lintels 18 ins. longer than the bearing and scantling 5½ ins. by the width of the brick-work. (See § 1041.)

Centering.

2291. To provide, fix, ease when directed, and finally remove all centering struts and supports requisite for the trimmers and for the other arches of brick and stone, particularly the two great North and South arches of the gateway, and for the stone dome over the gateway.

Casing to stone-work.

2292. To case up from time to time from injury as any of the same is fixed, the whole of the stone-work during the progress of the works.

CHAPTER XVIII.

Battening.

2293. To batten the whole of the internal brick-work of the building with inch deal battens 2¼ ins. wide not more than 10 ins. apart.

Sundries.

2294. To fix all the smith's work connected with the carpenter's work and joiner's work; to provide and fix all shores, fillets, beads, stops, blocks, bearers, furrings and linings; and to perform such rebating, tonguing, grooving, beading, housing, framing, and other proper labour and workmanship as may be requisite for the completion of the building.

Floors. Ground-story.

	Ins.		Ins.
Oak sleepers	5	by	4
Oak joists	5	—	2½

1½-in. rebated and filleted wrought flooring of yellow deal listed free from sap-wood.

Floors. One-pair story.

2295. Wall-plates ... ... 6 — 4
Joists (herring-boned down the middle thereof) ... 10 — 2½
Trimmers and trimming-joists ... ... 10 — 3
1¼-in. yellow deal straight-joint wrought flooring of half-boards listed free from sap-wood.

Flats to two wing-buildings.

2296. Wall-plates ... ... 6 — 4
Gutter-plates ... ... 12 — 12
Framed joists ... ... at upper end ... 10½ — 2½
Ditto ... ... at lower end ... 7½ — 2½
Trimmers one inch thicker.
1¼-in. yellow deal boarding for lead listed free from sap-wood.
1½-in. yellow deal parallel gutters current 2½ ins. to 10 feet on framed bearers with cess-pools to the pipes.
Inch yellow deal wrought tongued and beaded casing to gutter-plate and bearers.
2 Metal circular sky-lights with air-caps, balance-weights, brass pulleys, lines, curbs, furrings, and other fittings complete.

2297. Each of the two side flats is to have a strong trap-door therein prepared to be covered with lead, throated round the edges, and with frame complete formed so as to prevent the wet from driving in; each door is to be hung with strong hinges and two bolts; and the well of each trap is to be lined round with beaded deal.

Dome. (All this to be omitted if the outer dome be executed in masonry, brick-work, or earthen pots.)

2298. To construct the external dome according to the drawings, with lower curb 12 ins. by 8 ins. in two thicknesses of oak plank sunk and throated, 24 framed puncheons of oak 8 ins. by 8 ins., planked outside with 1½-in. oak; plate over the puncheons 6 ins. by 8 ins. in two thicknesses of 3-in. deal, 24 posts framed thereinto 6 ins. by 6 ins. at bottom and 5 ins. by 6 ins. at top, plate 6 ins. by 4 ins. framed upon the posts in two thicknesses of 2-in. deal, 48 external ribs each in two thicknesses of inch deal with 2 courses of inter-ties of 1½-in. deal 4½ ins. wide, two sets of braces of inch deal 4½ ins. wide, and boarded outside all over with 2-in. deal close jointed and rounded off to form proper curvilinear surfaces for receiving the copper covering:

PART II.

[redacted] consisting of 48 [redacted] twelve windows at [redacted] and [redacted] cases of 2-in. oak [redacted]

[redacted] [redacted] wrought-[redacted] plates.

		Ins.	Ins.
[redacted]	[redacted]	4	by 3
[redacted]	[redacted]	4	— 4
[redacted]	[redacted]	3	— 3
[redacted]	[redacted]	4	— 2
[redacted]	[redacted]	3	— 1½

[redacted] [redacted] with inch deal [redacted] grounds.

[redacted] [redacted] with square framed [redacted] 3½-in. butt-hinges [redacted] brass furniture.

[redacted] [redacted] external sashed-doors framed [redacted] [redacted] door-cases 6 ins. by 4 [redacted] with three 4-in. butt-hinges, [redacted] with brass furniture, [redacted] shutter with wrought- [redacted] complete.

[redacted] [redacted] 1¼-in. framed and grooved [redacted] architraves, and 1¼-in. linings. [redacted]

Gates. 2304. To [redacted] according to the drawings [redacted] consisting of two thicknesses of deal [redacted] panels of 1¼-in. yellow deal moulded [redacted] and filled in with cast-iron ornaments, and grooved and rebated capping on the top of the gates; and to hang the gates and render the same complete with fastenings value 8*s.* and hinges value 15*s.* exclusive of the fixing; one of the panels is to be formed with the ornament to open as a sight-hole.

Windows. 2305. To fit up the windows according to the drawings with 3-in. ornamental sashes, double-hung with large patent lines, brass axle-pulleys, iron weights, and patent spring fastenings, in deal-cased frames with oak sunk sills; and to put linings and mouldings round the windows the same as to the doors.

Shutters, &c. 2306. To fit up the windows with 1¼-in. bead-flush and bead-butt shutters hung as flaps with 2½-in. butts and with bolts and bars complete.

Staircases. 2307. To erect the stair-cases according to the drawings with 1¼-in. deal steps and risers wrought on both sides, and housed into 2-in. string-boards.

Water-closets. 2308. To fit up the two water-closets with 1¼-in. clean deal seats and risers inch deal mortise-clamped flaps and frames 2-in.

brass hinges, 2-in. dove-tailed cisterns, and all proper bearers, casings, and other fittings complete.

Closets.

2309. To fit up two of the closets with 1½-in. wrought and dove-tailed sinks, and to put in the other closets 50 feet superficial of inch wrought shelves with proper bearers.

50 feet cube fir in addition.

2310. (See § 1071.)

SMITH.

Chimney bars.

2311. To provide for each fire-place a chimney-bar 3 ins. by ½ in. properly corked at the ends thereof.

Chain-bar.

2312. To put immediately above the four great arches and all round the walls a chain-bar of wrought-iron 2½ ins. by ¾ in. in only four pieces.

4 cwt. iron ties, &c.

2313. To provide 448 lbs. of iron in such ties, straps, bolts, nuts, and other light wrought and hammered work, as may be requisite for the carpenter's work.

Railing.

2314. To make good up to the new building the inclosure railing of the park adjoining to the intended lodge.

PLASTERER.

L. P. F. S. and W. ceilings.

2315. To lath plaster, float, set, and whiten ceilings to the whole of the interior of the lodge.

Troweled stucco.

2316. To execute in troweled stucco floated upon laths the whole of the sides and partitions throughout the interior of the building.

Dome.

2317. To lath plaster and execute in stucco, and joint and colour to imitate stone, the inside of the upper dome.

Cornices.

2318. To run cornices 15 ins. girth round the rooms on the ground-story.

Arrises, beads, &c.

2319. To run and execute to the plastering the requisite beads, quirks, and arrises.

Lathing.

2320. The whole of the lathing is to be done with lath and half heart of fir laths.

PLUMBER.

8 lb. milled-lead flats and gutters.

2321. To lay the flats and gutters with milled-lead weight

[illegible] to the foot superficial, turned up at least 7 ins. all round the edges of the [illegible], and with rolls not more than 2 ft. 3 ins. apart.

[illegible] 2322. To put a flashing of 8 lb. milled-lead 2 ft. 6 ins. wide [illegible] of the upper dome, dressed up inside to prevent the wet [illegible] the timber and other work of the upper dome.

[illegible] flashings 2323. To put round the flats and gutters flashings of 5 lb. milled-lead 5 ins. wide [illegible] where necessary into the stone-work.

Sky-lights 2324. To put round each sky-light an apron of 6 lb. milled-lead 10 ins. wide.

Rain-water pipes 2325. To put two stacks of rain-water-pipe from the upper flat to the drains turned up 4½ ins. square out of 10 lb. milled-lead, and let flush into the stone-work behind the turrets and gates, as shown by the drawings.

Sinks 2326. To line the two sinks with 8 lb. milled-lead; and to carry off the water therefrom into the drains by strong lead 2½-in. waste-pipes with brass bell grates.

Water closets. 2327. To fit up the two water-closets completely with Bramah's patent valve apparatus, with traps, funnels, white basins, 4-in. strong service-pipes, air-pipes, and every other kind of requisite work. (See Index for water-closets.)

Cisterns 2328. To line the two cisterns the bottoms thereof with 10 lb. milled-lead and the sides thereof with 6 lb. milled-lead; and to lay on the water from the cisterns to the sinks by lead strong 4-in. pipes and cocks complete.

Pump &c. 2329. To provide and fix a 2½-in. pump complete with sufficient lead strong service-pipe and other work to throw up the water into the cisterns. (A more minute description of the pump-work may be given.)

4 cwt. extra milled-lead 2330. To provide under the contract 4 cwt. extra of milled-lead to be used in such other works about the building as may be by the architect directed.

Copper covering to dome 2331. To cover the upper dome entirely with sheet copper, weight 16 oz. to the foot superficial, seamed, shaped, and made complete according to the drawings; and to put over the dome the fleuron of chased copper, weight 30 oz. to the foot superficial.

The copper covering is to be turned out near the foot of the dome, so as to prevent the wet from drawing into the joints of the work.

PAINTER.

2332. To knot with silver leaf, stop, prepare, and paint four times with the best oil-colour the whole of the wood-works usually painted.

The sashes are to be finished outside dark purple brown.

To paint four times in like manner the iron-work and the internal stucco.

To paint four times to imitate stone the whole of the copper work and the rain-water pipes.

GLAZIER.

l glass.

2333. To glaze all the sashes and lights with the best second Newcastle crown glass, properly bedded, bradded, and back-puttied; and to clean and leave perfect the whole thereof immediately before the final rendering up of the building as complete.

loured glass.

2334. To glaze the twelve lights at the foot of the upper dome with orange-coloured glass.

CHAPTER XIX.

SPECIFICATION *for the erection of a* PARK *or* GARDEN WALL.

(A drawing should be made showing the plan and extent of the walling, and with a section and elevation showing to a larger scale the structure and form of the work.)

gging and ound-work.

2335. To excavate the ground for the foundation of the intended walling, and for all the piers and buttresses thereof, and as may be otherwise necessary for the performance of the intended work.

2336. *As on account of the undulating surface of the ground, it becomes necessary to make many gradations both in the levels of the foundations and summit of a boundary-wall of considerable extent, care should be taken in the drawing to show the manner in which this is to be effected, and clear explanation should be given whether the depth of the foundation is intended to be taken as the medium depth, or whether from the highest or lowest point of the ground against each severy of the wall.*

2337. To ram down the ground to the hardest possible consistence beneath the footings of the intended walling piers and buttresses; and when the foundations are laid, to fill in, beat down, and make up on both sides of the walling to levels corresponding with the nearest adjoining ground, as much of the ground to be dug out of the trenches as will be necessary for so filling up again and levelling the ground thereto.

2338. To remove and cart away all the ground remaining superfluous after the trenches are filled; and to dispose thereof in filling up the .

2339. *It will be necessary according to the nature and circumstances of the site, to consider whether it will be least expensive to cart away the superfluous earth, or to raise the surface of the ground on each side of the wall, giving to the brick-work the requisite additional altitude.*

2340. *If any portion of the ground be soft, it should be wholly dug out from under the intended brick-work, and either extra brick-work should be carried down below the ordinary bed of the work, or the necessary under-depth may be of concrete-work.* (See the Index.)

2341. *If the wall cross any rivulet or ditch, it must be well arched over; also if wall-trees are to be planted against it, the foundation of the wall should be arched out between the buttresses of it, so as to leave free space for the roots of the trees.*

Brickwork.

2342. To construct of brick-work the whole of the intended inclosure walls to surround the , according to the drawing, the first course of footings being 3 ft. thick, the second course of footings 2 ft. 7½ ins. thick, the third course of footings 2 ft. 3 ins. thick, and the fourth course of footings 1 ft. 10½ ins. thick.

2343. *The footings will require to be spread more or less according to the goodness of the foundation; in a detached wall they can hardly spread too much, and on that account they may be spread at every course, although in general they are best laid double or spreading at only every 6 ins. in height.*

2344. To carry up the walling from the footings upwards 2 ft. 6 ins. high in brick-work 1 ft. 6 ins. thick, and to carry up the walling from thence ft. ins. high 1 ft. 1½ ins. thick.

Buttresses and piers.

2345. To construct and bond in with the brick-work of the walling buttresses or piers not more than 10 ft. apart, 1 ft. 6 ins. wide, projecting on one (or on both, as the case may be) sides of the wall 4½ ins. and with all the footings of the foundation of the wall breaking in regular bond around each pier the same as to the wall itself.

2346. *The buttresses of boundary-walls should never break forward less than half a brick, nor should they break forward other than with projections of bricks or half bricks: if they project ¼ of a brick or ¾ of a brick, the bond with the rest of the work is sure to be broken, so that they become changed from buttresses to severances.*

Brick on-edge and tile-cresting (if any.)

2347. To finish or cope the whole of the walling with brick-on-edge (and double plain tile cresting, if any) both set in and jointed with equal measures of new quick Parker's cement, and clean river (*Thames*) sand.

[redacted]

IAPTER XIX.

f-round ng (if any.)

2348. *Or* To finish or cope the whole of the walling with half round coping-bricks set in and jointed with equal measures of new quick Parker's cement and river (*Thames*) sand.

2349. *These bricks may be made of an ogive form, or of any other shape so as to appear well; and if made something larger than usual so as to project they will appear better and will protect the wall more.*

dle-backed ing-tiles (if .)

2350. *Or* To finish or cope the whole of the walling (as practised in Hertfordshire and elsewhere) with saddle-backed coping-tiles joggled together and with throated projecting edges, set in and jointed with equal measures of new quick Parker's cement and river (*Thames*) sand.

linary park-l coping (if .)

2351. *Or* To finish the whole of the walling with one course of brick-work set angle-wise to project (or not to project, as the case may be) in the manner of saw-teeth, two courses of brick-work salient 2 ins. over the fronts of the tooth-work; and to set in and joint with equal measures of new quick Parker's cement and river (*Thames*) sand above the salient-work, a coping of bricks properly cut and laid raking so as to form a water-tabling, the back and front of which shall meet together at the top in a square angle.

2352. *The tooth-work of this description of coping may be done in many different ways so as to form a continuous dentil of bricks, laid flat-wise, edge-wise, or even upright: and a very bold and handsome character may be given to the walling, if the buttresses and salient head-work project both the same quantity; the salient-work forming between the buttresses a corbeille-table or machicolation; the corbeilles in shallow work being each formed of a single heading brick chamfered or rounded at the lower edge, and in bolder work each corbeille may consist of three such bricks projecting each beyond the other; in shallow work the salient head-work may be carried level from corbeille to corbeille, with only the lower arris slightly chamfered off; but if the projection be bold, scolloped-work or machicolations may be formed from corbeille to corbeille of bricks moulded on purpose.*

2353. *If the walling have any projecting plinth above ground, it will be well to finish this with moulded splayed bricks (set in Parker's cement), which in many parts of the country are to be obtained already made.*

2354. *Most of the country moulded bricks are red, and therefore of a disagreeable appearance. It is to be regretted that while bricks for common purposes are made in the neighbourhood of London, perhaps harder and better than those of any other situation, the metropolis is not provided with any of the numerous forms of moulded bricks which would be found so useful, and which would tend so much to the improvement of building. Moulded bricks, both yellow and white, would be found the most marketable.*

Again, if white or black chimney-pots of clay were sent to London, they would supersede the whole modern spurious

breed of chimney-pots of cement, Roman stone, and whited stone artificial stone.

Gate-piers.

2355. To construct, in addition to the other piers and buttresses, No. gate-piers according to the drawing, faced all round with the best washed malm-facing bricks (or with Ipswich white bricks or other bricks as the case may be).

Bedding.

2356. To bed in mortar and point, round the stone caps, bases, and hinge-stones of the gate-piers and gates; and to bed in mortar the stone (or iron) curbs or copings of the palisading (if any).

Bricks.

2357. The whole of the brick-work is to be composed (except where herein otherwise directed) of the very best well-burnt hard square approved grey stock-bricks (or of such other bricks as can be obtained as the case may be) without admixture of soft bricks, or broken bricks, or place-bricks, or other inferior bricks.

Mortar.

2358. The whole of the brick-work (except where herein otherwise directed) is to be laid in and is to be entirely flushed up at every course of the work with mortar composed of one third by admeasurement of the best Dorking (*or other, as the case may be,*) stone-lime and two thirds by admeasurement of the best sharp river (*Thames*) sand.

2359. *Common chalk lime should seldom be used in any work, and never in a park-wall. If good river sand cannot be obtained, good clean road drift may be used instead of it.*

Mode of doing the work.

2360. The whole of the brick-work is to be laid in manner of English bond; no four courses of the work are to rise more than one inch exclusive of the bricks; all the outer surfaces of the work are to be faced with the most clear and uniform in colour of the bricks; all the joints of the work are to be very neatly struck and are to be drawn.

2361. *A park-wall should never be faced with work in Flemish bond, that most fertile source of unsoundness in brick-work.* (See §§ 353—365.)

CHAPTER XX.

SPECIFICATION *for a* PALISADING *with* GATES *and foundation.*

BRICKLAYER.

Ground-work.

2362. (See No. 2336.)

CHAPTER XX.

Foundation brickwork, &c.

2363. To construct a foundation-wall for the support of the palisading, of brick-work with one course of footings 1 ft. 10½ ins. thick, one course of footings 1 ft. 6 ins. thick, and one course of footings 1 ft. 1½ ins. thick; and to carry the foundation-wall above the footings 2 ft. high and 9 ins. thick.

Spur-pieces.

2364. To construct and bond in with the brick-work of the foundation-wall spur-pieces not more than ft. ins. apart to receive the braces of the palisading.

Gate-piers and other piers (if any.)

2365. To construct No. piers for the gates and for the support of the palisading of brick-work according to the drawing.

Facings (if any.)

2366. To face the piers all round, and both sides of all the other brick-work from the surface of the ground upwards, with the best second malm stocks (*or with the best washed malm stocks or with the best white bricks as the case may be*) of uniform colour.

Bedding.

2367. To bed and point with mortar the iron curb (if any) and the stone blocks for the hinges and locks of the gates.

Bricks.

(See No. 1008.)

Mortar.

(See No. 1009.)

Mode of doing the work.

(See No. 1010.)

MASON. (See §§ 265—95.)

Gate-piers (if any.)

2368. To provide and fix No. gate piers of the best solid and perfect Aberdeen granite (*or other stone, as the case may be*) each with a base, a shaft, and a cap, each in one piece of stone, wrought and moulded according to the drawings, and with four plugs of copper 1 in. square and 2 ins. long in each horizontal joint thereof.

2369. *As it is desirable to make gate-piers as immovable as possible, it is well to compose them of as few pieces as possible, and if of granite they may be each in one single stone.*

Pier-caps (if any.)

2370. To provide and fix No. pier-caps, each formed of one piece of the best solid Portland stone, wrought, moulded, and throated according to the drawings.

Hinge-stones.

2371. To provide and fix No. hinge-stones of the best Aberdeen granite (*or of Portland or other stone, as the case may be*) each ft. ins. long, ft. ins. wide, and ft. ins. high, and to provide and fix at the feet of the gates, No. bases or socket-stones of Aberdeen granite, each ft. ins. long, ft. ins. wide, and ft. ins. high.

Curb (if any.)

2372. To provide and fix all along (such part as may be intended of) the (foundation) walling a curb of the best Aberdeen granite (or of Portland or other stone as the case may be) scant-

[redacted]

PART II.

[illegible] examined or moulded, as the [illegible] the drawing, run with lead at all the [illegible] other long rails in each joint.

[illegible] of the walling with stone [illegible] ins. wide, 4 ins. thick in [illegible] of each semi-circle, and of each semi-circle as to fit edges, and pinned and [illegible] through the joints.

[illegible] IRON-FOUNDER.

[illegible] for the brick-work [illegible] with cast-iron bars [illegible] may be intended), [illegible] *as the case may be*) iron [illegible] bottom-rail (*of* [illegible] *according to* [illegible] square and 20 ins. long,

[illegible] for the [illegible] in. [illegible] the brick-work

[illegible]

[illegible] gates according to [illegible] corresponding with [illegible] wrought-iron 1½ in. square, four [illegible] 8 ins. by ½ in. circular (or [illegible] wrought-iron 3 ins. by ½ in. [illegible] between the bars and rails: [illegible] cast-iron carriages, sockets and [illegible] stone lock entirely of copper [illegible] with socket, a swivel-stop to [illegible] gates are open, and two latches for [illegible] gates when open.

[illegible] To provide and fix to the gates, a pair of ornamental [illegible] to be of iron according to the drawings, with [illegible] of cast-iron and margins of wrought-iron.

2570. The iron-work is to be riveted together with copper, and is to be run with lead into the stone-work (*and iron curbs if any*) and is to be securely run with lead at all the horizontal rails and standard-heads.

2380. *Care should be taken, that no wrought-iron be inserted in any stone-work, on account of the bursting and certain destruction which the corrosion of iron causes to all stone in which it is inserted; more massy standards of cast-iron will give a palisading a better appearance than if with slender standards of wrought-iron. If the insertion of any wrought-iron braces in the stone-work be absolutely requisite, their ends should be tinned to protect them from oxidation; perhaps common red sealing-wax may have the same effect as tin.*

2381. *The superior durability of cast-iron cannot be better proved than by the palisading round St. Paul's Cathedral; which after nearly* 150 *years' exposure has suffered little, while wrought-iron is often completely rusted away in much less time.*

PAINTER.

2382. To scrape, clean, and burn free from all rust, the whole of the iron palisading, rails, (*curb if any*) gates, and gate-piers, with all the fittings and appertenances thereof; and to paint the whole of the said iron-work five times with the best oil colour, the first two coats of painting thereto being done with red-lead paint.

2383. The whole of the painting is to be finished stone colour (or of green or such other colour as may be intended as the case may be).

CHAPTER XXI.

SPECIFICATION FOR BUILDING AN ADDITIONAL WING *to a* VILLA *situate at , in the county of , and for making alterations to the present building for .*

(*Insert list of Working-drawings.* See § 986.)

BRICKLAYER.

Notice, &c. to District surveyor.

2384. To give to the district surveyor the requisite notice for an addition to a first rate building, and to pay him his proper official fee. (*This clause to be omitted if the house be without the jurisdiction of the London Building-act.*)

Remove, &c. garden wall.

2385. To take down so much of the present garden-walling as will require removal in order to form the intended additions to the dwelling-house; and to make good the said garden-walling up to the new building. To cut out an opening in the remainder

of the garden-wall, in order to receive the present garden door-frame, and to set therein the said door-frame and to turn an arch over the same and make good the joints thereto as at present.

Old bricks.

2386. To clean thoroughly from old mortar and stack up to be used again such of the old bricks as will result from the intended alteration to the present brick-work, which remain perfectly sound, undecayed, unbroken, of the quality of stock-bricks, and fit to be again used.

Digging, &c.

2387. To excavate the ground for the formation of the intended additions to the basement-story of the house, and its offices and appertenances, and for the drainage and the dry-areas and other areas thereof, and also for the laying of the several foundations of the intended new works, and for the performance of such of the other works of the buildings as will of necessity require excavation; to beat down, ram, and render hard and level the bottoms of all the trenches for the intended new brick-work; and when the brick-work is executed, to fill in and consolidate the ground in and about the walls and other brick-work as may be found requisite according to the situation and the nature of the work.

Cartage and rubbish.

(See § 988—9.)

Alterations, &c. to the present building.

2388. To take out the present door and door-frame of the basement external entrance; to cut out for a new basement external doorway in the situation shown by the drawings; to fix therein the old door and door-frame; and to stop up and make good in a workmanlike manner with new brick-work the present aperture; and in like manner to make good round the new doorway, and to turn an arch over the same.

2389. To alter and enlarge the way down to the basement external entrance, in the manner shown by the drawings; and to put thereto all requisite additional brick-work.

2390. To take out the present windows of the north-eastern room on the basement story, and to re-fix the same in new apertures in the situations shown by the drawings; to make good the brick-work round the same, and to turn arches thereto in a workmanlike manner; and to move and make good the brick-work of the area thereto.

2391. To build a new brick wall to divide the intended new dairy from the office-passage, with foundation 18 ins. below the upper surface of the basement floor, and consisting of two courses of 18 in. brick-work and two courses of 14 ins. brick-work; and to cut away the projections from the old brick-work in the intended northern extension of the basement-passage, and to make good the brick-work so as to be proper for receiving the plastering and other finishings thereto.

2392. To construct proper supports of brick-work for the slabs in the intended new dairy.

2393. To fill in with brick-work the opening in the basement-

wall leading to the present stair-case, and to make good the other adjacent brick-work after the present basement stairs and the fittings therewith connected are removed.

2394. To cut out in the situations shown by the drawings, and make good thereto openings from the three stories of the present building to the intended new wing-building; and to turn arches over the several new openings in a sound and workmanlike manner.

2395. To alter and make good to the kitchen-flue as may be found requisite in consequence of the intended alterations.

2396. To take down the present breast-walling under the present verandah, and to build new breast-walling as shown by the drawings as well to the old verandah as also to the intended new verandah; to construct to the said walling abutment arches as shown by the plan and sections, and to cut out the brickwork for the reception of the back edges of the stone landings, and to make good thereto with sound new brick-work.

Make good floors, gutters, &c. &c. &c.

2397. To take down the chimney-stack in the present drawing-room and in the chamber above the same, with the shaft thereof; and to construct according to the drawings a new chimney-stack on the north side of the drawing-room, and on the north side of the chamber above the same, with shaft trimmers and the other requisite appertenances to correspond with the present chimneys at the south-eastern part of the building; and to make good in a workmanlike manner all the brick-work damaged by the removal of the present chimneys.

eneral brick-ork.

2398. To execute in the very best manner all brick-work requisite for carrying into effect the intended additions and other works and alterations according to the drawings, and so as to render the whole house with its offices and appertenances complete and finished in every respect.

n hooping.

2399. To provide and work up in the new foundations and in such other parts of the new brick-work as the Architect may direct, 10 cwt. of strong vat-hooping in order to strengthen the work.

hes.

2400. To turn over the several windows and other openings in the intended new brick-work, arches with proper skew-backs; to form counter-arches under the several openings where the nature of the work will admit thereof; and to turn arches over the several apertures intended to be made in the present brick-work.

neys.

2401. To properly turn parget and core all the flues, to put to each new fire-place a chimney-bar of wrought-iron 3 ins. by ½ in. properly corked at the ends thereof, and to put to each fire-place a trimmer of 4-in. brick-work.

To carry up all the chimney-shafts according to the drawings, and to put over each new flue an ornamental white chimney-pot of baked clay.

dents, &c.

2402. To cut and parget proper perpendicular indents in the

old brick-work where requisite in order to receive the intended new brick-work, and to make good in a workmanlike manner all damage caused by cutting the indents.

Carriage. (See § 1244.)

Bedding. 2403. To bed in mortar all the bond-timber plates lintels wood-bricks templets and other work so requiring; to bed and point round with lime and hair mortar all the door-frames and window-frames; and to back up to and make good with solid brick-work to all timbers, stone-work, and other things to be set in the brickwork.

Piers. 2404. To put under the sleepers of the flooring, brick piers each consisting of two courses of brickwork 9 in. square and two courses of brick-work 9 ins. by 4 ins.

Cross walls. 2405. To put under the joints of the paving of the new dairy and of the closets and other parts of the basement-story intended to be paved, 4-in. brick cross walls 12 ins. high.

Brick paving. 2406. To pave with hard stock-bricks laid flat in mortar and grouted also between the joints with liquid mortar, the whole of the intended areas as well those under the verandahs as at the other parts of the basement-story, and the whole of the intended new coal-cellar.

Drainage. 2407. To construct round the new wing-building in the situation shown by the basement-plan, a barrel drain 12 ins. bore, properly connected with the present drainage, and stuccoed over the lower half $\frac{1}{4}$-in. thick with pure quick Parker's cement; and to pipe from the soil-pipe and from each rain-water-pipe and drain-sink a proper brick hopper, and to construct also a stench-trap in the new drain. (See §§ 1001 and 1104.)

Air-bricks. 2408. To provide and fix in the new brick-work, 10 cast-iron air-bricks for the ventilation of the floors.

Rate of extra brickwork. (See § 1007.)

Bricks. (See § 1008.)

Mortar. (See § 1008.)

Mode of doing the work. (See § 1010.)

Lime-whiting. 2409. To lime-whiten twice the areas round and opposite to the windows of the additions to the basement-story.

Jobbing-work. (See § 1011.)

[redacted]

[APTER XXI.

MASON. (See §§ 265—269.)

kshire stone ›und ation.

2410. To bed and joint in mortar under the brick footings of the principal new walls of the intended additions to the house, two courses of 3-in. Yorkshire stone of the several widths shown by the drawings, and where not so shown in such case 4 ins. wider than the lowest course of footings. The whole of the Yorkshire stone to be laid under the brick-footings is to be set with the joints thereof close and crossed as much as possible upon each other; and no stone thereof is to contain less than 5 ft. superficial.

ing.

2411. To take up the present paving of the verandah, and to use the sound parts thereof in paving the intended new dairy, the new office-passage and the store-room, and other parts of the basement-story which are not intended to be paved with brick, or to be floored with wood; and to provide sufficient new 2-in. Yorkshire stone and to complete therewith the whole of the said rooms, passage, closets, and other parts of the basement-story; the whole of the said paving is to be laid in regular courses, and is to have the joints thereof wrought quite fair through the whole thickness of the stone.

'ering to dry- a.

2412. To cover the dry-area next the kitchen-garden with 3-in. tooled Yorkshire stone, with close tooled joints and outer edges; and to let thereinto the gratings to the windows of the servants' hall and office-passage.

w verandah ›rs.

2413. To put to the present verandah and to the upper and lower verandahs of the intended new wing-building, entire floorings of the very best sound new Portland stone 4 ins. thick, of the several widths and forms shown by the drawings; the whole of the said flooring is to have joggle-joints in the situations shown by the plans effectually run with lead.

2414. The upper verandah-flooring is to be moulded in front as shown by the drawings; and the other verandah floorings are to be wrought with square edges, and are to be throated.

›ps and Land- t.

2415. To construct according to the drawings to the lower verandahs, steps scantling 6 ins. by 13 ins., and a landing 4 ins. thick, all of the best solid Portland stone, each step in one piece, and the whole to be securely fixed on brick foundations.

:ternal base- ›nt-steps, &c.

2416. To take down the present external basement-steps, and to alter, adapt, re-fix, and make the same complete, so as to suit the basement-entrance as intended to be altered in situation; and to re-lay and make complete the paving at the head and foot of the steps, providing all requisite new materials.

ternal base- ent stairs.

2417. To construct a new basement stair-case according to the drawings, with treads and risers of 3-in. Yorkshire stone with fair tooled edges.

ew Portland

2418. To construct a new stair-case from the ground-floor

Stone principal stairs.

to the one-pair story, with steps and semicircular landing, entirely of solid Portland stone, tailed 9 ins. into the brick-work, with moulded returned nosings, and the steps from the semicircular landing upwards (where the soffits thereof come in view) having the moulded nosings thereof returned also at the back and with the soffits also moulded all over to the shape of the ends of the steps.

Window-sills.

2419. To put to the windows of the intended new principal stair-case, butler's room, new chamber, new dressing-room, two new water-closets, and the store-room on the ground-story, and to the blank external recesses on the West side of the intended new wing-building, sills of the best Portland stone 9 ins. by 5 ins. properly sunk, weathered, and throated.

Sills of basement story.

2420. To put to the new windows of the basement-story, sills of 3-in. Yorkshire stone 10 ins. wide, wrought with fair edges, throated, and laid sloping.

Chimney-pieces.

2421. To provide and fix in the new dining-room, a chimney-piece of dove marble according to the drawings, no part of the marble thereof being less than one inch thick.

2422. To provide and fix in the new boudoir, according to the drawings, a chimney-piece of the very best perfect and unblemished white statuary marble, no part of the marble thereof being less than one inch thick.

2423. To provide and fix in the new chamber, a chimney-piece of the very best white and blue veined marble according to the drawings, no part of the marble thereof being less than one inch thick.

2424. To put in the new dressing-room, inch blue veined marble mantle jambs and shelf, each 5 ins. wide, and inch blue veined marble slips 3½ ins. wide.

2425. To put in the intended enlarged drawing-room two chimney-pieces, according to the drawings, of (or *state* the value of).

2426. To take down, clean, repair, re-polish, re-fix, and make complete to the intended new chimney, the chimney-piece of the North-east room on the one-pair story.

2427. To put to the chimney in the new butler's room mantle jambs and shelf of 1¼-in. Portland stone 6 ins. wide, and to put to the chimney in the new servants'-hall 1½-in. Portland stone mantle jambs and shelf 7 ins. wide, and to put to each of the last-mentioned chimneys slabs of the best Portland stone 2 ins. thick.

Hearths.

2428. To put to each of the new chimneys a back hearth of the best rubbed 2-in. Yorkshire stone.

Dairy.

2429. To form all round the intended new dairy in the basement-story, a complete shelf, dresser, or platform, as shown by the drawings, consisting of slabs of smooth slate in large pie

and full ½-in. in thickness, and with a skirting of similar slate 6 ins. wide carried all round against the brick-work at the back of the shelf.

Sundries. 2430. To cut out the stone-work where requisite for the insertion of the iron-work, and for all pipes and wherever else may be requisite for the proper completion of the whole of the works of every kind.

Sink-stones. 2431. To provide and fix in the pavings where the architect shall direct, four five-hole sink-stones each properly dished out of a piece of 4-in. Yorkshire stone 12 ins. square.

Jobbing-work. 2432. To perform to the building and its offices and appertenances all such work and labour as may be requisite thereto in the nature of jobbing as well to the new works as also in adapting and completing the old works to the same.

SLATER. (See §§ 542—3.)

Countess slating. 2433. To cover the whole of the sloping roofing of the addition-building with the very best strong countess slates pointed on the inside thereof with good stone-lime mortar with sufficient hair therein.

Nails, bond, &c. 2434. The whole of the slating is to be securely fixed by strong copper nails; the joints of the slating over the bow-wing of the building are to be radiated to the apex of the roof; and all the remainder of the slating is to have proper similar bond in every part thereof, particularly at the eaves and at the heading-courses, with cut slates instead of having, as in the more usual mode, slates laid lengthwise with slips or smaller slates between them.

Reparation. 2435. To repair, make good, and leave perfect to the satisfaction of the architect all the new and old slating of the villa and of its additions.

CARPENTER AND JOINER. (See § 337—340.)

New materials, &c. 2436. To provide new materials for, and frame, fix, and finish all carpenter's work and joiner's work which may be requisite for carrying into effect according to the drawings the intended additions, alterations, and works to the dwelling-house, and to the offices and appertenances thereof.

Ironmongery, &c. 2437. To provide for the carpenter's work and joiner's work and use and fix thereto, all requisite spikes, nails, screws, and other proper ironmongery, and all requisite brass-work; the whole of the ironmongery and brass-work are to be of the very best quality, and all the hinges are to be of wrought-iron.

Timber and deal. 2438. All the oak timber is to be of the best English growth;

all the other timber is to be either Dantzic, Riga, or Memel fir of the best quality, unless where herein otherwise directed; and the timber and deals are to be cut most perfectly square and exactly to the full sizes required, and all other defects: none of the knots, shakes, wane, sap, and other defects are to be respectively larger than [illegible].

2439. The whole of the new wood-work is to be properly primed with two coats of oil colour for the prevention of dry rot.

Old timber. 2440. Such of the timbers and other wood-work to be of [illegible] taken down and removed in order to make to the building the improvements the intended additions and alterations, are to be used again in the performance of the intended works so far as the size or nature of other wood-work may agree with the [illegible] workmanship of the intended work, as directed in the specification.

Scaffolds. 2441. To provide and fix all requisite shores, struts, puncheons, scaffolding, ties, bands, irons, rilets, tilting-fillets, and other [illegible] hinges, casings, linings, and rods; to provide all boards, nails, and materials requisite for setting out and for executing whatever all the several intended works of the dwelling-house and the offices and improvements thereof. (See [illegible].)

Iron straps, &c. 2442. To provide and fix in and about the intended works [illegible] wrought-iron straps, ties, screw-bolts, [illegible] cramps, and hammered work as the Architect shall direct, as to the said quantity and all deductions [illegible] than after the rate of five pence per pound [illegible] including the fixing thereof.

Brick-work. See [illegible].

Brick-work. 2443. To put in the new brick-work complete tiers of fir bond-timber at the several heights shown by the sections, and where the walls of the new walls, properly lapped and spiked together, lengths as great as possible.

2444. The bond-timber in the external-walls is to be of scantling [illegible] to be laid, as to project one inch before the walls, and to leave a cavity between the battening and the brick-work; and the other bond-timber is to be scantling 4 ins. by 2½ ins. The laps in the bond-timber are not to be less than 6 ins. long. (See 1687—8.)

To put all wood-bricks requisite for fixing the finishings.

Battening. 2445. To batten the new external brick-work of the ground-story and one-pair story, as shown by the drawings, with inch yellow deal battens 2¼ ins. wide, not more than 11 ins. apart.

Lintels. See § 1611. 2446. To put to all the windows and other openings requiring the same, fir lintels 5½ ins. high, 18 ins. longer than the clear bearing, and as wide as required by the brick-work.

APTER XXI.

ment floor-

2447. To construct to the new servants' hall and to the closets thereto attached, the flooring with oak sleepers 5 ins. by 3 ins., and fir joists 4 ins. by 2½ ins., and to lay the same with 1¼-in. yellow deal wrought flooring-boards listed clear from sap-wood.

irs, altera-, and making to the pre-basement ng.

2448. To take up the boarded floor upon the site of the intended new dairy in order to admit of the intended paving thereto, and to repair and make complete the flooring to the office-passage, and to the remainder of the basement-story where any alterations or damage will occur.

nd flooring.

2449. To construct the ground-flooring to the intended new dining-room, new butler's room, new store-room, and to the closets and lobby thereto attached, with joists 9 ins. by 2½ ins., trimmers and trimming-joists 9 ins. by 3 ins., and wall-plates 6 ins. by 4 ins.; and to lay the whole of the same with 1¼-in. yellow clean deal flooring-boards listed free from sap-wood sawn down the middle and laid in half-boards not more than 4 ins. wide.

2450. All the parts of the timbers of the ground-flooring which are laid in the external brick-work are to be thoroughly pitched to prevent the same from being rotted. (See § 1281 and 1752.)

ing to new &c.

2451. To take up the present boarded flooring on the site of the intended enlargement to the hall; to repair the present timbers of the flooring; to put in new timbers sufficient for completing the naked flooring in a corresponding manner, and to lay the whole of the same, including the four closets, with new 1¼-in. yellow deal boarded floor as described to the remainder of the ground-story.

irs to old id-flooring.

2452. To make good in a complete neat and workmanlike manner the floor of the drawing-room, and the other parts of the ground-flooring where any alterations are intended to be made thereto, so that the said floorings when made good may have an uniform appearance without patches therein.

pair flooring.

2453. To construct the one-pair flooring of the intended new boudoir, new chamber, new dressing-room, and of the closets and landing thereto attached with joists 12½ ins. by 2¼ ins., trimmers and trimming-joists 12½ ins. by 2¼ ins., two tiers of herring-bone struts between the joists, and wall-plates 6 ins. by 4 ins.; and to lay the whole thereof with 1¼-in. yellow deal flooring-boards as described to the ground-story.

irs to one-looring.

2454. To fill in the flooring of the one-pair story to the well-hole of the present stair-case, and to the other parts of the one-pair flooring of the present building where any alterations are intended to be made thereto; and to render the whole of the one-pair flooring of the present building in all respects complete and perfect as described for the ground-flooring.

ing to the ipal stair- &c.

2455. To construct the flooring to the principal stair-case and the corridor on the one-pair story and to the two new water-closets with fir joists 7 ins. by 2¼ ins., trimmers and trimming-joists

7 ins. by 2¾ ins., and to lay to the same 1¼-in. yellow deal flooring as described for the new dining-room.

Sound boarding.

2456. To put to the whole of the floorings of the intended new wing-buildings sound boarding of ¾ in. deal properly chopped and fixed upon fillets, for the reception of the plugging.

Roofing. See 48 41[illegible] and [illegible]

2457. To construct the roofing over the intended new wing-building with timbers and other work of the following description:

	Ins.	Ins.
Wall-plates	6	by 4
Rafters	5	— 2½
Three tie-beams...	12	— 4½
Ridge and hips rounded for lead	10	— 1¼
Angle-ties and dragons...	5	— 3
Slate-battens	2½	— 1
Feather-edge lear-boards 6 ins. wide.		
Ceiling-joists in one length firmly spiked beneath the tie-beams...	3	— 2
Ceiling-joists to the dressing-room	4	— 2
Ceiling-joists to the boudoir firmly spiked to the sides of the rafters	5	— 1¼
Circular segmental cradling to the boudoir in two thicknesses of inch deal firmly secured to the ceiling-joists.		
Joists to the flat between the old building and the other new roof	6	— 2½
Wall-plate under ditto	5	— 4
Inch yellow deal boarding for lead listed free from sap-wood, laid with firrings to a current of not less than 1½-in. to every 10 ft., and with rolls for the joints of the lead, and inch deal riser next the eaves of the adjoining roof.		

[illegible] See [illegible]

2458. To form all round the new building a gutter according to the drawings, with inch deal bottom laid to a current of not less than 1½-in. to every 10 ft., inch deal soffit-board upon strong cut brackets inserted 18 ins. in the brick-work, 1¼-in. fascia-board with solid moulding thereon, ¾-in. deal inside lining next the rafters, and sufficient strong wrought-iron securing ties from the fascia to the roof.

Quartered partitions of new wing. See [illegible] and [illegible]

2459. To construct the quartered-partitions of the intended new wing, according to the drawings, with timbers of the following scantlings:—

	Ins.	Ins.
Top and bottom plates	4	by 4
Plates above the doors	4	5½
Struts above and below ditto	3	3½
King-posts and queen-posts	4	7
Door-posts and door-heads	4	3½
Quarters	4	2
Two tiers of inter-ties to each partition	3	1¼

Remove, &c. old quartered partitions, &c.

2460. To take down the quartered-partitions with the doors and other fittings now separating into a chamber a dressing-room and a lobby the intended enlarged north-eastern chamber; to remove the door-dressings, and to fill in with quarters the door-

way in the quartered-partition at present leading into the next chamber, and the present doorway leading into the south-west chamber.

quartered-tions in pre-building.

2461. To construct and put up in the present building a quartered-partition to form a passage to lead to the northern wing thereof, with timbers of the following scantlings :—

	Ins.	Ins.
Upper and lower plates	4	by 3
Centre suspending post	4	7
Outer ditto	4	5
Struts	4	3½
Quarters	4	2
Two tiers of inter-ties	3	1¼

2462. To inclose the corridor leading from the intended new principal stair-case on the one-pair story, through into the old building; and to inclose also the closets thereto attached by quartered-partitions with plates 4 ins. by 3 ins., posts 4 ins. by 3½ ins., braces 3 ins. by 4 ins., quarters 4 ins. by 2 ins., and three tiers of inter-ties 3 ins. by 1¼ ins.

e staves.

2463. To put in order to protect the projecting angles of the new plastering proper rebated angle-staves securely fixed.

ings.

2464. To put round the intended dining-room, stair-case, boudoir, chamber, dressing-room, new entrance-hall, and the lobbies and corridors thereto attached, moulded skirtings as severally shown by the drawings.

2465. To fit up all the new closets and all the remainder of the intended new additions to the house above the basement-story with inch deal square skirting 8 ins. high.

2466. The whole of the skirtings are to be fixed with the requisite ploughed grounds and substantial backings.

2467. To make good in the most complete neat and workmanlike manner all the skirtings of the old building wherever any alterations are intended to be made.

ters.

2468. To fit up, as shown by the drawings, the addition to the entrance-hall, the corridor over the same, and the several lobbies with pilasters of 1¼-in. deal free from shakes and other defects, and fixed with the requisite grounds and backings.

mns and re-ing partition een the pre-dining-room present draw-room.

2469. To take down the whole of the quartered-partition between the present dining-room and the present drawing-room, in order to unite the two rooms so as to form a large drawing-room; to provide and fix on the site of the present partition two columns and two semi-columns of 2 in. clean deal properly glued and blocked, and with moulded bases according to the drawings; to put over the columns a fir plate 6 ins. by 6 ins., and proper strong cradling to receive the intended plaster architrave which is to be 6 ins. high and with a soffit 10 ins. wide; and to put within each of the two detached columns a core of fir 6 ins. by 6 ins. chamfered at the corners thereof.

Cradling

2470. To form out with cradling of 1¼-in. deal, under the [illegible] to the intended enlargement of the entrance-hall, to the [illegible] over the same, to the principal stair-case, [illegible] thereto adjoining, in an accurate manner [illegible] the drawings in order to receive plasterer's work to [illegible] of beams and panels upon or under the [illegible].

2471. To put proper cradling in two thicknesses of inch deal very securely fixed in order to receive the arched ceiling of the [illegible] and the domed ceilings of the principal stair-case and of the [illegible] by the boudoir and dining-room.

2472. To form sunk coffers in the ceilings for the reception of the intended five flowers.

Water-closets

2473. To take up and remove the seat riser and other carpenter's work and joiner's work belonging to the present water-closet on the ground-story of the house; and to clean, repair, alter as may be required, make all requisite additions thereto, and adapt refix and make the same complete and perfect in the situation on the ground-story shown by the drawings.

2474. To fit up the intended new water-closet on the one-pair-story of the new wing, with the very best inch pencil cedar seat, inch best handsome Spanish mahogany riser and clamped [illegible] frame, the top moulded on the edge and hung with a pair of 12 in. strong brass hinges fixed with gilt headed screws.

2475. To put to the two water-closets all requisite bearers, blocks, and other fittings, and to attend upon and assist the plumbers while fixing the apparatus and other appertenances of the water-closets.

2476. To provide and fix casings of inch deal to conceal all the pipes of the water-closets hung with hinges and buttons in proper rebated, grooved, and beaded grounds.

Stair-case

2477. To fit up the intended new stair-case with the mahogany hand-rail of the present stair-case, cleaned, adapted, repolished, and made complete with the requisite additional hand-rail of similar quality and with all requisite joint-screws; and to provide and fix to the same stair-case ornamental balusters of cast-iron according to the drawings, with a wrought-iron rail under the mahogany hand-rail.

2478. To inclose under the principal stairs and round the head of the new basement-stairs with 1½-in. moulded and square-framed spandril-partitioning, with an opening left therein for the door to lead down to the basement story.

Steps leading to the new boudoir, &c.

2479. To form of 1¼-in. deal the steps leading up to the lobby adjoining the intended new boudoir, with strong bearers and with moulded nosings.

Doors

2480. To put to the intended new dining-room, to the intended new boudoir, to the intended new chamber, and to the

intended new dressing-room, 2½-in. four-panel doors, moulded on both sides and framed according to the drawings, with centre double margins to appear like folding-doors, and hung each with a pair of 4-in. butt-hinges, and a very best strong and perfect mortise-lock, with handsome brass furniture.

2481. To put to the intended butler's room, to the intended new store-room on the ground-story, to the intended two new water-closets, to the doorway leading down to the basement-story, and to all the intended new closets on the ground-story and one-pair story, new 2-in. doors framed each in four panels (except where otherwise shown by the drawings) with moulded fronts and square backs, and hung with 3½-in. butt hinges, each of the closet-doors in the entrance-hall hung with three hinges, and each of other doors hung with two hinges. To put to each of the doors of the butler's room, store-room, and water-closets, a best mortise-lock with furniture complete as described to the 2½-in. doors, to put to the store-room a strong 7-in. best iron-rimmed lock with plain strong brass furniture, and to put to each of the new closet-doors a best strong iron rimmed 5-in. closet-lock, with two keys and a brass escutcheon.

2482. To put at the bottom of the principal stair-case a 2½-in. external door, moulded on both sides, with a moulded sash, and an 1½-in. shutter thereto framed in two panels bead-flush on both sides and with wrought-iron corner-shoes, two stubs with plates, two strong thumb-screws, and a sunk shutter-lift, and to hang the door with a pair of 4-in. butt-hinges two 10-in. bright barrel-bolts and a very strong mortise-lock with a brass handle on each side thereof, and with the other requisite brass furniture.

2483. To fit up the intended new servants' hall, closets, and other parts of the basement-story, with the old doors which from the intended alterations to the present building will become unnecessary to the other parts of the house, each of the said doors after being properly repaired and made perfect being hung with the requisite new hinges, locks, and other appertenances, the present hinges locks and other appertenances thereof being however used again after being cleaned and made perfect, and the brass work thereof re-laquered.

2484. To take out the present door-frame and fan-light of the front entrance of the house, and to alter as occasion may require and refix the same close to the interior of the entrance-hall, so as to leave an external porch, and to re-hang and make complete the doors and the fittings and appertenances thereof.

oor-linings, chitraves, &c.

2485. To fit up the new door-ways of the basement-story and of the one pair story, with all door-linings and dressings as far as the same will go to be taken down from the present house in consequence of the intended alterations, but repaired adapted and made in all respects complete.

2486. To put to the external doorway of the stair-case, a fir proper door-case 5 ins. by 5 ins., tenoned at bottom into a stone step and with a piece of 4-lb. milled-lead 15 ins. square,

wrought round the reveses thereof, and to put to the same doorways [illegible] moulded and headed linings.

2487. To put to all the remainder of the doorways of the present house [illegible] moulded door-linings, those of them which [illegible] wide, being framed each set in three pieces to [illegible] flush with the doors; to put on each side of [illegible] framed door-grounds 5 ins. wide, with [illegible] framed faces to each door-way; and to put to the same doorways moulded architraves as shown by the drawings, to each of them however which do not require extra projection in order to strip the skirting, having the mouldings laid upon the grounds without additional faces.

New windows.

2488. To put in the bow-fronts of the intended new dining-room and intended new boudoir, 24-in. deal moulded circular [illegible] of lights, hung with hinges, fastenings, and other [illegible] of quality equal to those of the present drawing-room windows, and in fir proper frames 6 ins. by 5 ins., with oak [illegible] sunk sills.

2489. To put to the intended new chamber, new dressing-room, and new staircase, 2-in. deal moulded sashes, double hung with the best large patent lines, iron weights, the best brass axle-pulleys, and the best patent spring fastenings, in deal cased-frames with oak [illegible] sunk sills.

2490. To put to the intended new butler's room, two new [illegible] windows, new servants' hall, and two new water-closets, and to the intended window of the dressing-room attached to the present southernmost chamber, 1¼-in. deal ovolo sashes, double hung with the best large patent lines, iron weights, the best brass axle-pulleys, and the best patent spring-fastenings, in deal cased-frames with oak double sunk sills.

Old windows.

2491. To repair thoroughly, refix, and make complete, the present windows of the office-passage and of the intended dairy.

Shutters, &c.

2492. To fit up the windows of the intended new dining-room, new boudoir, new chamber, and new dressing-room, according to the drawings, with 1¼-in. one-panel moulded soffits backs and elbows with beaded cappings, 1¼-in. two-panel bead-flush back linings, 1¼-in. moulded and bead-flush front shutters, and 1¼-in. bead-flush and square framed back-flaps, the front shutters and back-flaps hung in two heights with strong hinges and with strong fastenings the same as to the present drawing-room, in 1¼-in. proper boxings, with mouldings thereon in order to form architraves according to the drawings.

Window-linings, &c.

2493. To fit up the windows of the intended new butler's room, with 1¼-in. one-panel square framed soffits backs and elbows with beaded cappings, 1¼-in. two-panel square framed back-linings, and 1¼-in. square framed shutters and back-flaps with ¾-in. panels, hung in two heights with strong hinges and strong bar fastenings, in 1¼-in. proper boxings with mouldings thereon in order to form architraves according to the drawings.

2494. To fit up the intended two new water-closets with 1¼-in. square framed three panel window-backs with ¾-in. panels, and 1¼-in. square framed shutters hung as sashes with large patent lines, iron weights, brass axle-pulleys, and screw-fastenings, in proper deal cased-frames with architrave-mouldings, and cover-boards hung upon hinges.

Window-linings, &c.

2495. To fit up the window of the principal stair-case with rebated angle staff beads 1½ in. diameter.

To fit up the new windows of the servants' hall, the other windows of the new parts of the basement-story and the window of the new store-room on the ground-story with inch deal tongued and beaded linings and window-boards, with proper bearers and backings.

Closets.

2496. To inclose the four closets in the intended enlargement to the entrance-hall with 1½-in. deal framed and beaded; and to perform all work and labour requisite in order to construct according to the drawings the several other intended closets.

Shelves, &c.

2497. To put in each of the intended new closets and store-rooms four tiers of shelves of inch deal securely fixed with the requisite brackets and bearers; in the shallow closets the shelves are to be as wide as the whole depth of the closet; the bottom shelf at the end of the store-room on the ground story is to be wide; all the other shelves are to be 10 ins. wide.

2498. To remove from the present butler's pantry the closets and the other fittings thereof, and to repair, make complete, and refix the same in the intended new butler's room.

Bulk to basement external entrance.

2499. To form a bulk head of 1½-in. yellow deal grooved, tongued and beaded, to inclose and divide the external entrance to the basement steps from the present larder.

Old verandah.

2500. To take down the whole of the present verandah of the house, to repair thoroughly the whole of the wood-work thereof, providing the requisite new work for such of the present work as may turn out defective, and to refix the whole of the said verandah upon the intended new stone landing, with the requisite alterations and additions, so as that the verandah may suit the intended increased width of the terrace or balcony upon which the same is to be fixed, and with additional rafters to support the curved rafters as shown by the drawings, with crown plate and 2½-in. moulded skylight to receive the intended plate-glass near the summit of the verandah; and to cover the whole of the circular part of the top of the same verandah with zinc sheeting, weight 14 oz. to the foot superficial, properly dressed and secured like the present covering; and to put along the front of the house at the upper edge of the verandah-roof a flashing 6 ins. wide of zinc, weight 16 oz. to the foot superficial.

New verandahs.

2501. To provide and fix all round the two stories of the bow-front of the intended new wing-building, pilasters, friezes, and balcony-fronts, all of ornamental open cast-iron work according to the drawings, formed so as to support securely the roof and the stone-landing of the upper verandah, and so as to form frame-work in order to receive Venetian blinds; the whole of the

[redacted] be securely fixed and is to be run with lead [redacted] 1½-in. in diameter are to [redacted] architrave of the upper [redacted] in order to pre- [redacted] from thrusting the [redacted] ceiling, and the inside [redacted] is to be lined [redacted] with a moulding. (*In [redacted] extend over and to form a* [redacted]

[redacted]

[redacted]

PLASTERER.

[redacted] between the joists [redacted] building of the house, [redacted] in every part thereof [redacted]

[redacted] with one coat of lime and hair a [redacted]

[redacted] ceilings to all the [redacted]

[redacted] coffers to all [redacted] the house, and to the [redacted] and to the corridor and [redacted] story; the [redacted] and the ceilings to the [redacted] to the boudoir and the [redacted] stair-case are to be [redacted] is to be conical [redacted] the rafters.

[redacted] ceilings to the intended enlarge- [redacted] corridor immediately over the [redacted] stair-case, and to the lobbies thereto adjoin- [redacted] according to the drawings, the appear- [redacted] to form panels in the ceilings and to render [redacted] decorations of the said ceilings.

Cornices. 2507. To execute to the new dining-room, new boudoir, new chamber, new dressing-room, new stair-case, and to the intended enlargement of the entrance-hall, and to the lobbies and corridors therewith connected, the several moulded and enriched cornices according to the drawings, with proper enriched honeysuckle and other mitres thereto.

Flowers. 2508. To put in the ceilings five enriched flowers according to the drawings with proper sunk coffers and moulded and enriched frames, complete models of the said flowers being deposited with the architect.

CHAPTER XXI.

Modelling, capitals, &c.

2509. To form according to the drawings a complete plaster model of a Corinthian capital, in two separate halves, to be left in the possession of the architect; and to provide and fix copies thereof in plaster to the two columns and two semi-columns in the centre of the intended enlarged drawing-room; and to form above the same columns, an architrave with enriched soffit; and to make good the cornices and other plastering which will be destroyed or injured by uniting the present dining-room and the present drawing-room.

To provide in like manner models for the pilaster-capitals according to the drawings, and to deposit the same with the architect; and to finish the several pilasters with plaster casts thereof.

To put at the heads of the pilasters in the lobby leading to the boudoir, four plaster enriched trusses according to the plaster model to be deposited with the architect.

Take off old external plastering.

2510. To take off the present old external plastering of the house on the side thereof next the intended new wing-building.

R. S. C. basement, butler's room, and store-room.

2511. To render, set, and colour, the whole of the internal brick-work of the intended new basement stair-case, new servants' hall, new office-passage, and new closets and new store-room on the basement-story, and the whole of the unbattened brick-work of the butler's room and of the closet and store-room adjoining thereto.

Trowelled stucco.

2512. To execute in the very best trowelled stucco lathed where requisite, the sides of the intended new dining-room and of the new water-closets, stair-case, and new entrance-hall, and of all the lobbies, corridors, and closets therewith connected.

L. P. F. and set to sides.

2513. To lath, plaster, float, and set for paper-hanging all the remainder of the quartered-partitions and battened sides of the intended new works.

R. F. S. to sides.

2514. To render, float, and set for paper-hanging all the remainder of the internal new brick-work of the house.

External stucco.

2515. To cover the whole of the new external brick-work (except that under the verandah) with the very best stone-lime outside floated and trowelled stucco, jointed to represent masonry, and prepared to receive oil painting.

2516. To make good in a neat and workmanlike manner all damage which may by the execution of the intended works be done to the present external plastering of the buildings.

Beads, quirks, &c.

2517. To run and execute all requisite beads, quirks, and arrises.

P. C. skirting.

2518. To put all round the new parts of the basement-story skirting of pure Parker's cement 8½ ins. high, one inch thick, and teinted stone-colour.

Jobbing-work.

2519. To make good in a thorough and workmanlike manner all damage of every kind which by the execution of the intended

works will be caused to the plastering of the present building; and to perform to the new building and to the present building all plasterer's work requisite thereto in the nature of jobbing in order to complete the intended new works and to connect properly therewith the old works.

PLUMBER.

4 lb. milled-lead to slope and hips. (See § 1200.)

6½ lb. milled-lead to cornice, gutter, valley, chimney-gutters, and flats. (See Index.)

4 lb. milled-lead flashings. (See § 1200.)

Water-closets. (See Index.)

Butler's sink. (See Index.)

Cisterns. (See Index.)

Pipes. (See Index.)

PAINTER.

2520. To knot, stop, pumice smooth in every part thereof, prepare properly and paint four times with the best oil and white-lead colours, the whole of the new internal and external wood-work, iron-work, and other works usually painted, including all the internal and all the external stucco; and to prepare, bring forward, and paint in like manner four times with the best oil-colour, all the old works which will be altered or damaged in consequence of the execution of the other intended works.

GLAZIER.

Plate-glass.

2521. To glaze with the very best plate-glass the whole of the windows of the intended new dining-room and of the new boudoir, and the external door of the new principal stair-case.

2522. To glaze in like manner with plate-glass in squares 15 ins. wide and 2 ft. long the whole flat top of the present verandah of the house after the same has been raised and widened.

Best Newcastle glass.

2523. To glaze with the very best Newcastle crown glass the whole of the sashes of the intended new chamber, of the new dressing-room, of the two new water-closets, and of the window of the dressing-room adjoining to the old South-east chamber, the lower row of panes of the last-mentioned window being ground.

2nd Newcastle glass.

2524. To glaze with good second Newcastle crown glass all

the remainder of the intended new windows and lights; the glazing to the new store-room on the ground-story is to be ground.

Repairs, cleaning, &c.

2525. To cut out all the glass of the whole of the house and of the offices thereof now broken, and all the glass which during the progress of the works may be broken; and to make good all the same with new glass to match properly the old sound glass.

2526. To clean and leave perfect at the final rendering up of all the works as complete, the whole of the glazing of the house and of the offices thereof.

CHAPTER XXII.

SPECIFICATION OF THE WORKS *to be done in erecting and completing fit for occupation a* MANSION-HOUSE *with the offices and appertenances thereof for at*

(Insert here a list of the Working-drawings. See § 986. *)*

BRICKLAYER.

Clearing the site.

(If the site of the buildings have to be cleared, insert a clause accordingly, for which see §§ 1228 and 2152.)

Digging, cartage, &c.

(Insert this clause according to the nature of the site and buildings. See §§ 988—9.)

Rubbish.

(See § 989.)

General brickwork.

(See §§ 990—1.)

Rough arches and counter-arches.

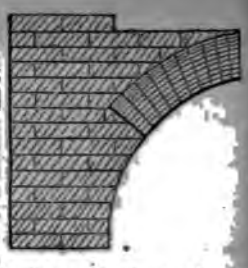
(See Index.)

Ganged arches.

(See §§ 1097. 358, and 570—94.)

Vaults. (See Index.)

2527. To construct to the coal-cellar wine-cellar beer-cellar and basement-passage, arched and groined vaultings according to the drawings with the groin-points, or arrises accurately cut, and with the spandrils of the arches in all cases filled in with brickwork up to the level of the internal crown of the vaulting. The whole of the vaulting is to be completely grouted in a solid manner with liquid mortar, and when the centering is removed the whole of the vaulting is to be neatly pointed quite fairly and evenly.



2528. In vaultings the author has lately adopted with good success the method mentioned in § 508, of corbelling out the springing walls gradually to the proper curvature, till the arch-work becomes disengaged from the whole thickness of the springing-wall as practised at Cologne cathedral, thus the weight of the abutment is increased, the span of the arch is diminished, and the part of the wall above the arch does not hang ready to slide from off the back of the arch: this corbelled springing-work may be set in Parker's cement, or it may be made of stone.

Dry-areas.

2529. To construct round the building the dry-areas according to the drawings. [Dry-areas are made in two ways; either with their walls battering against the ground, and covered over with paving-stones, or with their walls nearly perpendicular, and arched over on the top: in all cases they should be well drained and ventilated: if they are to be accessible, they should be paved with brick or stone.]

Chimneys.

(See §§ 996—7.)

Chimney-pots.

(See Index.)

Indents (if any).

(See § 1243.)

Cuttings.

(See Index.)

Bedding, &c.

(See § 999.)

Parker's cement against basement walls.

2530. (If the ground lie against any of the basement walls add the following):—

To stucco the walls of the basement-story ¾-in. thick, with the best new quick pure Parker's cement.

Brick-nogging.

2531. (See Index.)

Brick-nogged partitions on account of their unsoundness ought to be avoided as much as possible, the brick-work of them is destitute of bond, and from the almost universal rotting of the timbers of them they soon become ruined; they should never be used in basement-stories, or other damp situations; they afford no saving of even present expense; the only case in which they should be admitted is in contracted situations where economy of space will not allow of the requisite thickness for brick-work.

Piers.

2532. To construct under all the sleepers of the timber-floors, for the support thereof, brick piers 12 ins. high, consisting each of one course of work 13½ ins. square, and three courses of work 9 ins. square.

2533. (*Note, If the flooring be much raised above the original level of the soil, the brick piers will be required*

greater height, in which case no rubbish or earth needs to be filled in between them, as that would lead to an useless additional expense.)

2534. Some persons out of an affectation of magnificence lay wood sleepers upon continuous walls, whereas floorings should have the least possible contact with the earth. If the situation be damp, a piece of sheet-lead should be laid upon each pier to preserve the wood from rotting.

2535. To erect cross-walls of brick-work 4 ins. thick and 12 ins. high, for the support of the paving of the entrance-hall, principal stair-case, back stair-case, larder, office-passage, and lobbies.

2536. *If the paving be laid much above the original level of the soil, the cross walls should be higher so as not to stand upon raised ground, but to reach from the original surface up to the paving; and if they exceed* 12 *ins. in height, they should have at least one course of footings* 9 *ins. thick; and if they exceed* 2 *ft. in height, they should be principally of brick-work* 9 *ins. thick, with footings* 13½ *ins. thick,* 12 *ins. in height of the upper parts of them may however be only* 4 *ins. thick.*

2537. To pave the whole of the cellars and the passages therewith connected, with the best malm paving-bricks, set closely on edge in manner of herring-bone, in mortar, and grouted completely all over and between the joints with liquid mortar. See also Index.)

2538. *If the mansion be erected in a situation where white bricks and tiles can be obtained without distant carriage, a very beautiful description of paving can be made use of without extra cost: white bricks may be herring-boned alternately with red bricks, and white paving tiles may be laid either diagonally or at right angles with the walls, and may be bordered or chequered alternately with red tiles.*

Paving-tiles may be made either white or red, of hexagonal octagonal or of other shapes, so as to afford cheap, beautiful, and durable pavings of various kinds and combinations. They are so made in the county of Essex.

(See §§ 1001—4.)

(See §§ 1097.)

(See §§ 994.)

(See Index.)

(See § 1007.)

(See § 1008.)

(See § 1009.)

(See § 1010.)

Scaffolding. (See Index.)

Jobbing-work. (See § 1011.)

MASON. (See §§ 265—295.)

Yorkshire stone under the foundation. (See §§ 1115, 1373, 2259, 2411.)

Plinth. 2539. To provide and fix all round the principal build continuous plinth of Portland stone 2 feet high and 8 ins. in lengths of not less than 3 ft. each vertical joints having th two T cramps of copper each 15 ins. long clasped behind i brick-work. (*Note. These cramps may be omitted.*)

Rustic quoins (if any). 2540. To provide and fix at the angles of the build the manner shown by the drawings, rustic quoins of solid land stone each 11¼ ins. high (*or of such other height as th may be as may suit exactly the height of* 3, 4, 5, *or* 6 cou *brick-work*) and of the same width as the height and in one half greater than the height.

If the angles of the rustics are to be channeled o fered, or if the faces of the stones are to be decorat rock-work, &c. a description accordingly must be inserte

String-courses. 2541. To provide and fix all round the principal buil string-course of Portland stone scantling 9 ins. by 6 ins., th and moulded according to the drawings, and plugged with all the joints thereof.

Sills. 2542. To put in the windows of Portland stone 9½ ins. by 6 ins.

To put to the windows of moulded Portland stone 14 ins. by 8 ins.

To put to the windows of sills of Ab granite finely tooled and scantling 14 ins. by 9 ins.

To put to the remainder of the windows throughc buildings sills of Portland stone 9 ins. by 5 ins.

All the window-sills are to be properly sunk, weathere throated, and are to be each 4 ins. longer than the width window-opening.

Cornice. 2543. To put all round the four fronts of the mansion nice of Portland stone scantling 2 ft. by 10½ ins. moulded ing to the drawings, and with proper sunk water-joints, an neled and plugged with lead at all the joints therein.

Blocking course. 2544. To put above the cornice all round the four fr the mansion, a blocking-course of Portland stone 18 ins 9 ins. thick at the bottom and 8 ins. thick at the top, p with lead at all the joints, and with solid quoin-stones re each way 2 ft. at the least.

2545. *Sometimes the stones of a blocking-cou*

united by cramps let into them either on their tops or at their backs; but this is hardly necessary, except near the quoins, as plugs prevent any particular stone from being moved without those which adjoin it; but two copper wire plugs may with propriety be set in the bed-joint of every stone of the blocking to prevent it from sliding from its proper position upon the cornice.

The specification may state whether any portions of the blocking-course are to have any additional height.

ing (if

2546. To construct the balustrading according to the drawings, entirely of Portland stone, with plinth 18 ins. high and 8 ins. thick, pedestals 2 ft. high, 2 ft. wide, and 8 ins. thick, plinths below the pedestals 18 ins. high, 2 ft. 4 ins. wide, and 12 ins. thick, impost 4½ ins. high and 12 ins. wide with the requisite additional scantling to the portions thereof forming the caps to the pedestals; balusters wrought out of stone 2 ft. 1 in. high and 7 ins. square, tenoned at the ends thereof into the plinth and impost: all the vertical joints in the balustrading are to be plugged with lead.

2547. (If there be any half-balusters joined to the pedestals, the pedestals will require stone 2 ft. 7 ins. wide.)

dress-

2548. To finish the chimney-shafts with sunk moulded and throated copings of Portland stone wide and 6 ins. thick. (For chimney-pots see §§ 1124, 2274, and Index.)

dress-door- (if any). f any).

(See Index.)

(See Index.)

(if any).

2549. To face the fronts of the mansion with Portland stone ashlaring, cut out in courses to suit in height four courses of the brick-work (*or somewhat less than* 11¾ *ins. in height*): the whole of the ashlaring is to be formed in the manner and in the proportion of the Flemish bond of brick-work, that is, alternately with headers 8½ ins. deep from the face of the work, and stretchers 4 ins. deep from the face of the work and twice the length of the headers; so that the average thickness of the ashlaring will be 5½ ins. exclusive of the quoins, which are in no instance to show stone of less thickness than 12 ins.

2550. To construct a stair-case leading down to the basement-story, with solid Yorkshire quarry-steps, scantling 13 ins. by 6½ ins., properly back-jointed and pinned into the brick-work.

This stair-case, without any additional expense, may be made of solid granite, street-curb 12 *ins. by* 7 *or* 8 *ins., and this being of a hard granulated substance, which will not flake by frost or damp, will be much more durable; but against this advantage may be placed the inconvenience of granite steps wearing inconveniently slippery.*

(The steps, for cheapness, may be made of Yorkshire stone paving, for which see § 1451.)

ir-case ie).

(See § 1450.)

stair- f stone).

(See §§ 1459, 2419, and Index.)

Landings.

2551. To construct the landings according to the drawings, those to the Yorkshire stone-stairs of Yorkshire stone 4 ins. thick, with the requisite risers also of Yorkshire stone, and those to the principal stair-case of Portland stone 6 ins. thick, with moulded nosings and with joggled joints run with lead. All the landings are to be inserted in the walls 4 ins. deep at the least, and such of them as only tail into the walls in the manner of steps are to be inserted in the walls full 9 ins.

Yorkshire stone paving.

2552. To pave the scullery, larder, pantry, and the passages and lobbies of the offices with rubbed Yorkshire stone full 2½ ins. in thickness, and laid in regular courses with close rubbed joints.

Castle-hill stone paving.

2553. To pave the dairy with rubbed Castle-hill stone 1½ ins. thick laid in regular courses with sawn joints thereto.

Portland stone paving.

2554. To pave the back stair-case, the porch or lobby against the side-entrance, and the other lobbies on the ground-story, with Portland stone 2 ins. thick, laid in uniform squares (if diagonally, that should be stated,) and with a border of similar Portland stone 8 ins. wide all round the said paving.

Marble paving.

2555. To pave the whole of the entrance-hall, and the principal stair-case and the corridor thereto attached, with the best polished Italian white and blue veined marble one inch thick, in uniform squares, and with a border of similar marble 6 ins. wide all round the said paving.

2556. *If the paving be chequered with marble of any other colour, or be laid diagonally, the description should be drawn accordingly.*

2557. *A thin marble paving should be laid upon a coarse paving of Yorkshire or some other cheap description of stone: sometimes thin pavings are laid upon boarded floors, but the wood is in such a situation very liable to rot, and from this cause and from admitting of agitation thin pavements laid upon it are very liable to fracture.*

Marble cold bath.

2558. To construct the basin of the Cold bath according to the drawings; to render the same completely water-proof by sufficient Dutch terras properly applied; and to line the whole of the basin with Italian white and blue veined marble one inch thick, rebated together, set in Dutch terras, and securely plugged and cramped with copper at all the joints therein; to put all round the basin a border of similar marble 12 ins. wide, with a rounded and polished nosing; and to construct of similar polished marble the steps leading down into the cold bath.

A cold bath may be fitted up in a much cheaper manner with slate about ¾ in. thick.

Dairy.

2559. To fit up the dairy as shown by the drawings, with a dresser or table round the same of inch Italian white and blue veined marble one inch thick, with a skirting round over the same of similar marble 6 ins. high.

Sometimes economy is consulted by fitting up dairies with thick smooth slate, or with plain white or printed Dutch galley-tiles of glazed earthenware.

[redacted]

APTER XXII.

cellar. 2560. To fit up the wine-cellar as shown by the drawings, with shelves and divisions of 3-in. Yorkshire stone fairly tooled all over, and securely set with Parker's cement.

doorways. 2561. To build in each of the cellar-doorways three pieces of Portland stone 18 ins. wide, 18 ins. long, and 9 ins. high, and to cut out for and let into two of the same and run with lead to each of the doorways the hinges, and to let into one of the other stones to each doorway the locking-box.

2562. *The use of door-case of wood to cellars should be avoided.*

s. 2563. To put to each of the fire-places throughout the buildings a back hearth of 2½-in. rubbed Yorkshire stone.

chimney- (See § 2564. To provide and fix in the dining-room a dove marble chimney-piece according to the drawings, in value 30 guineas, exclusive of the carriage and fixing, and to put thereto a slab of dove marble one inch thick, long, and 20 ins. wide.

2565. To provide and fix in the library a chimney-piece of Kilkenny marble, with a slab of similar marble full one inch thick, value together 25 guineas, exclusive of the carriage and fixing.

2566. To provide and fix in the withdrawing-room a chimney-piece according to the drawings of the best, perfect, unblemished statuary marble, with a slab of similar marble full one inch thick, value together 60 guineas, exclusive of the carriage and fixing.

2567. To provide and fix in the boudoir a chimney-piece, with a slab thereto, as described to the drawing-room, but in value 40 guineas, exclusive of the carriage and fixing.

2568. To provide and fix in each of the best 4 chambers, a chimney-piece according to the drawings of the best, perfect, and clear and handsomely veined Italian white and blue marble, with a slab of similar marble full one inch thick, in value together 25 guineas, exclusive of the carriage and fixing.

2569. To provide and fix in each of the four dressing-rooms and in each of the eight other superior chambers, a marble chimney-piece according to the drawings of white and blue veined marble, or of such other description of marble as may be chosen, and with a slab of similar marble full one inch thick, in value together to each chimney 12 guineas, exclusive of the carriage and fixing.

2570. To provide and fix to the kitchen-chimney, jambs and mantle of 2-in. Portland stone 10 ins. wide, and to put to the same chimney a slab of 2½-in. rubbed Yorkshire stone.

2571. *There exists a ridiculous custom of making kitchen mantles each of 3 pieces of stone, with the affectation of a key stone, which generally causes such mantles to sink considerably in the middle.*

2572. To put in the butler's room and housekeeper's room Portland stone chimney-pieces according to the drawings, and with slabs of 2-in. Portland stone 4 ft. long and 1 ft. 8 ins. wide.

2573. To put to all the other fire-places throughout the mansion and its offices, jambs mantles and shelves of 1¼-in. Portland stone 6 ins. wide, and slabs of 2-in. Portland stone long and 20 ins. wide.

Holes, rebates, &c. (See §§ 2285—6, and Index.)

Cleaning off work. (See § 2287.)

Reparation of injury. (See Index.)

SLATER. (See §§ 542—3.)

Imperial slates to principal roof. (See Index.)

Duchess slates to roof. (See Index.)

Countess slates to other roofs. (See § 1023.)

Bond-nails, &c. (See § 1024.)

Reparation. (See § 1025.)

CARPENTER and JOINER. (See §§ 337—340.)

Clerk's office. 2574. To provide, erect, and maintain during the time the works are being carried on, a temporary office for the Clerk-of-the-works, with door, sashed window, wood floor, and all other fittings and appertenances complete ; and to provide and place in the same a stool and also a table to receive the drawings. (*Note.* If a chimney be required to this temporary building, a clause to that effect must be inserted in the bricklayer's work.)

New materials, &c. (See § 1029—30.)

Timber and deals. (See § 1031.)

Sundries. (See § 1032—3.)

Centering. 2575. To provide, fix, ease when directed, and finally remove, centering and turning-pieces sufficient for all the gauged and rough arches and trimmers and for the groined vaultings and other vaultings of the cellars and of their passages, with all requisite struts, supports, wedges, and other proper and necessary appertenances.

Casing to stone-work, &c. (See § 2292.)

Bond timber, &c. (See §§ 1036—7 and 1138.)

[redacted]

APTER XXII.

ils. (See § 1040.)

		Ins.	Ins.
and floors.	2576. Oak sleepers...	5 by	3
	Fir joists	4½ —	2½
	1¼-in. right wainscot straight-joint floor to the library edge-nailed.		
	1¼-in. wrought clean straight-joint yellow batten flooring edge-nailed to the remainder of the principal building.		
	1¼-in. clean deal wrought straight-joint flooring of half boards edge-nailed to the remainder of the story.		
r floors.	2577. Wall-plates	6 —	4
	Girders	14 —	12
	Joists	10 —	2¼
	Trimmers and trimming-joists	10 —	2¼
	Cradling of inch yellow deal to the girders and other parts of to form the ceiling into panels and coffers according to the drawings.		
	1¼-in. wrought clean straight-joint yellow batten flooring edge-nailed to the principal building.		
	1¼-in. clean deal wrought straight-joint flooring of half-boards edge-nailed, to the servants' chambers and to the passages and lobbies thereto attached.		
f over the cipal building. §§ 411, 430— nd 520—30.)	2578. Wall-plates	6 —	6
	Angle-ties (each 6 ft. long) and dragon-pieces... ...	12 —	2½
	Pole-plate	5 —	4
	Purlins	7 —	5
	Rafters	4½ —	2
	Hips and ridges rounded for lead	10 —	1½
	Valley-pieces	10 —	6
	10 Tie-beams	12 —	6
	8 Return ditto	12 —	4
	28 Principals ... ...at bottom 7 ins. by 6 ins. at top	6 —	6
	28 Queen-posts	8 —	6
	10 Collar-beams	7 —	6
	8 Return ditto	7 —	4
	10 Straining-sills	3½—	5
	28 Struts	3½—	6
	Binders	9 —	4
	Ceiling-joists spiked in one length beneath the binders	3 —	2
	Slate-battens	2½—	1
	Lear-boards	10 —	0¾
s.	2579. Wall-plates	6 —	6
	Joists	10 —	2½
	Trimmers and trimming-joists	10 —	3
	1¼-in. yellow deal boarding for lead, listed free from sap-wood, laid with a current of 1½ in. to every 10 ft. lineal, and with 2½-in. drips to the heading-joints of the lead, rolls to the longitudinal joints of the lead, and inch yellow deal risers not less than 4 ins. wide next the gutter.		

ner. (See Index.)

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Wainscot sashes, &c.

2587. To fit up the best four chambers and the five dressing-rooms with windows the same as those last described, but with the sashes, pulley-styles, and sash-beads of the very best right wainscot French polished.

Deal sashes.

2588. To fit up the remainder of the principal buildings, with

windows the same as those last described, but with 2-in. yellow deal moulded sashes 1¼-in. yellow deal pulley-styles and deal sash-beads.

2589. To fit up all the remainder of the buildings with windows the same as those last described, but with 2-in. deal ovolo sashes.

Boxed shutters.

2590. To fit up all the windows (except) with 1½-in. shutters prepared and hung as in two heights but not cut, in 1½-in. proper boxings sunk rebated and beaded; all the front shutters are to be framed to correspond with the doors of the rooms and other places in which they are placed; the backs of the shutters of the office-buildings are to be framed square, and all the backs of all the other shutters are to be framed bead-flush.

2591. To put to all the boxed shutters, handsome knobs to pattern, and shutter-bars (*spring-shutter-bars, or moveable shutter-bars as the case may be.*)

2592. To put to all the windows, 1¼-in. bead-flush back-linings, and 1¼-in. deal backs, elbows and soffits framed to correspond with the front shutters, and with beaded cappings and elbow-caps.

Shutters hung as sashes (if any).

(See Index.)

External shutters (if any.)

(See Index.)

Internal shutters without boxings (if any).

(See Index.)

Doors.

2593. To fit up the dining-room, drawing-room, library boudoir, and entrance-hall, with the best handsomely figured 2½-in. Spanish mahogany French polished double-margined doors, moulded on both sides according to the drawings, and hung with the best 4-in. brass butt-hinges with tempered steel-plates in the hinge-knuckles, and fixed with gilt-headed screws, and with the very best strong well made mortise-locks with handsome brass furniture to pattern. The outer doors of the entrance-hall are to have sashes therein, and ironmongery in addition to the lock and hinges of the value of 20*s.*

(See §§ 531—557.)

2594. *It is very customary to veneer mahogany with more curious wood; this may for a short time give the work a more splendid appearance, but after a very few years the glue by which the veneers are stuck on failing by the effect of damp, the veneers assume a crumpled appearance, and the work appears worn out, while a solid door will after many years still be sound; a proprietor who wishes a valuable mansion to descend unimpaired and with credit to his posterity, will carefully avoid every thing of the unsound and flimsy nature of so much of our modern building.*

2595. To fit up the best four chambers, the five dressing-rooms, and the side entrance-lobby, with doors in all respects as those last described, except that they are to be of the very best right Dutch wainscot French polished.

2596. To fit up the remainder of the doorways of the principal building with doors in all respects as those last described, except that they are to be of deal.

2597. To fit up all the cellars with 2-in. oak four-panel doors framed bead-butt on both sides and hung each with a pair of strong hook and eye hinges and a 9-in. best copper-warded lock with two keys thereto.

2598. To fit up all the doorways of the office-buildings with 2-in. deal four-panel doors, hung with 3½-in. butt-hinges, and with a best strong 7-in. iron-rimmed lock with three bolts and with strong plain brass furniture to each, except to the outer doorways which are to be framed bead-flush on the outside, to be hung each with three 4-in. butt-hinges, a 10-in. draw-back lock with strong brass furniture, two wrought-iron dogs with sockets, and two 12-in. bright barrel-bolts.

Closet doors.

2599. To put to all the closets 1¼-in. deal doors framed to correspond with the doors of the respective rooms and other places in which the same are to be placed, and hung with 3½-in. butt-hinges and a patent tumbler lock with brass escutcheon to each.

Door-cases.

2600. To put to all the outer-doors, oak proper door-cases 6 ins. by 5 ins. with sills 5 ins. by 4 ins.

Door-linings.

2601. To fit up all the door-ways with 1¼-in. double rebated linings, framed, each set in three panels to correspond with the respective doors intended to be hung therein.

Grounds.

2602. To put round on both sides of each door-way inch deal framed and ploughed grounds 4½ ins. wide, with six dovetailed braces of inch deal 4 ins. wide to each door-way.

Architraves.

2603. To finish the door-ways of the office-buildings with mouldings laid upon the grounds; and to finish all the other doorways with moulded architraves according to the drawings.

2604. To lay upon the boxings of the shutters mouldings to correspond with those to the architraves of the doors.

Principal staircase (if of wood).

2605. To construct the principal stair-case according to the drawings, with landings, treads, and risers of the very best 1¼-in. right Dutch wainscot, tongued, and with moulded returned nosings, on strong bracketed carriages, 1½-in. wainscot moulded, beaded cut and mitred string-board with carved brackets thereon, 1¼-in. wainscot wall-string, 1¼-in. wainscot apron-linings to correspond with the string-board, framed turned and carved balusters and newels of real wainscot, and large wainscot moulded hand-rail with scroll to the curtail-step.

2606. *Some fine examples are in existence of stair-cases constructed in the richest possible manner of solid carved mahogany, or other valuable wood, all the newels being in imitation of Corinthian columns, the hand-rail forming a kind of entablature to them, and a mahogany carved dwarf wainscot-*

ting with Corinthian pilasters being carried against the wall all the way up the stair-case to correspond with the hand-rail and newels; a beautiful stair-case of this kind is to be seen at No. 60, Carey-street, London.

Mahogany hand-rail (if any).

2607. To put to the stone principal stair-case (*if any*) a large complete handrail of the best handsomely figured solid Spanish mahogany, with ramps, scroll, and other proper curvatures, grooved in order to receive the iron-work, and securely fixed together with proper heading-joints and screws.

2608. *There are several processes by which hand-rails are glued up from small pieces, but the use of these ought to be discouraged for the same reasons as those mentioned at* § 2594. *Among other alleged modern improvements, none has been carried further than the quality of flimsiness.*

Back stair-case (if of wood).

2609. To construct the back stair-case according to the drawings. (See § 1175.)

Columns. (See § 552.)

2610. To provide and fix in No. columns according to the drawings, with shafts of 2-in. yellow deal glued and blocked complete with bases in horizontal layers of yellow deal crossed in the grain upon each other.

Pilasters.

2611. To provide and fix in No. pilasters according to the drawings of 1¼-in. yellow deal glued and blocked, with bases and capitals according to the drawings.

Entablatures.

2612. To form of yellow deal the entablature to according to the drawings securely fixed upon 1¼-in. deal cradling not more than 11½ ins. apart.

Best water-closets.

(See § 1173.)

Common water-closets.

(See § 1339.)

Privies.

(See § 1339.)

Warm bath.

2613. To fit up the warm bath with the very best handsomely figured inch Spanish mahogany riser frame and clamped flap fixed with all requisite bearers and other proper fittings and appertenances, the flap is to be moulded in front and is to be hung with four 3-in. strong brass butt-hinges, and the riser is to be paneled and moulded according to the drawings.

Cistern.

(See § 1338.)

Sinks.

(See Index.)

Butler's sink.

(See Index.)

Pipe-casings, &c.

(See 2477.)

Dressers.

2614. To provide and fix in the kitchen, a dresser, with cross-tongued top of 2-in. clean deal 10 feet long and 2 ft. 9 ins.

wide, supported on strong framed legs and bearers; inch deal pot-board on strong bearers; six sunk shelves of 1¼-in. deal 7 ins. average width; inch deal wrought beaded grooved and cross-tongued back behind the shelves; four shaped standards of 1¼-in. deal; inch deal top 14 ins. wide with moulded cornice thereto; five drawers with bottoms and dove-tailed rims of ¾-in. deal, fronts of inch deal beaded, two strong brass drop handles, and a good patent tumbler-lock to each drawer; and slides, runners, bearers, and all other proper and necessary work and appurtenances complete.

2615. To put in the scullery, a dresser-top of 1¼-in. clean deal 2 ft. 6 ins. wide and 6 ft. long, cross tongued, and fixed upon strong wrought and framed legs and bearers.

Plate-rack. 2616. To provide and fix in the scullery, a strong plate-rack of wainscot complete, — ft. — ins. wide, — ft. — ins. high, and — ins. deep.

Fittings in the larder. (See Index.)

Other fittings. (See Index.)

Sol. extra fittings. (See § 1414.)

200 cubic feet fir extra. (See § 1071.)

Jobbing-work. (See § 1070.)

SMITH.

Chimney-bars. 2617. To provide and fix to the kitchen-chimney, two wrought-iron cradle-bars each 2 ins. by ¾ in. and in length extending quite through to the outsides of the chimney-jambs, and corked at each end; and to put to each of the other fire-places of the buildings, a wrought-iron chimney-bar 3 ins. by ½ in.

Air-gratings. 2618. To provide and fix in the brick-work, thirty air-gratings of cast-iron with frame-work according to the drawings.

Stirrup-irons, &c. (See Index.)

20 cwt. extra ties, &c. (See Index.)

Balusters, &c. to stair-case. 2619. To provide and fix to the back stair-case and to the landings thereof (*if of stone*) wrought-iron balusters ¾-in. square, turned wrought-iron newel equal to 1½-in. diameter, and rounded hand-rail of wrought-iron 1½ in. by ½ in. the balusters and newel riveted at top into the hand-rail and let at bottom into the stone-work and run thereinto with lead.

2620. To provide and fix to the principal stair-case, and to the landings thereof (*if of stone*), ornamental cast-iron panelled balusters, and newels, according to the drawings, and top-rail of wrought-iron 1¼ in. by ½ in. to be let into and to be secured

screwed to the mahogany hand-rail; and the balusters and newels riveted at top with copper into the iron-rail and let at bottom into the stone-work and run thereinto with lead.

PLASTERER.

L. P. F. and set.

2621. To lath, plaster, float, and set ceilings and strings (to the wooden stair-case if any) to the whole of the mansion and the offices thereof, and the quartered partitions of the servants' chambers.

2622. *In a good building the meanness of plastering which is not floated properly should never be admitted.*

Stucco.

2623. To execute all the remainder of the sides of the whole of the interior of the mansion and of its offices, with the very best floated stucco lathed where requisite; the stucco of the office-buildings is to be finished with rough surfaces, and all the other stucco is to be troweled quite smooth.

Arched work, groins, panels, &c.

2624. To execute all the arched and groined ceilings, bands, architraves, panels, and coffered-work, according to the drawings in the best and most accurate manner in gauged-stuff.

Cornices, enrichments, &c.

2625. To run plaster cornices round the several rooms and other parts of the buildings according to the drawings, and to put thereto the several enrichments accurately modelled.

To put in No. centre flowers modeled according to the drawings.

Parker's cement skirtings.

2626. To execute round the basement-story and round the ground-story of the office-buildings, skirtings of Parker's cement 10 ins. high 1¼ in. thick, and whitened while yet soft, and when dry teinted stone colour.

Sundries.

2627. To execute all requisite beads quirks and arrises; to stucco all the internal reveals; to perform all requisite dubbing out; to find all needful additional projections and thicknesses; and to counter-lath the work all over any large timbers and where else may be requisite.

All the requisite lathing is to be done with lath-and-half heart of fir laths free from sap-wood; all the enrichments are to be carefully finished or trimmed; all the principal leaves and other heavy embossed work are to be secured by strong copper screws; and all the mouldings are to be run with copper moulds.

Whiting.

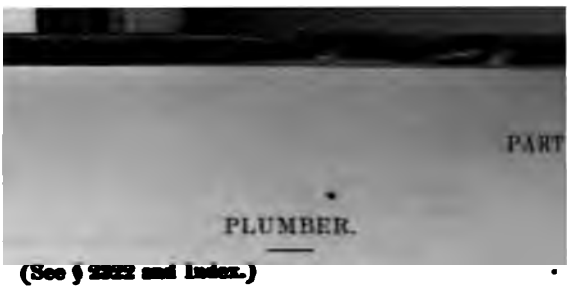
2628. To whiten all the ceilings of the office-buildings.

Colouring.

2629. To colour of such teints of stone or drab as may be directed, the plastering to the sides of the offices.

Lime-whiting.

2630. To stop and lime-whiten twice, all the internal unplastered brick-work of the offices and cellars.



6 lb. cast lead-gutters and valleys. (See § 2322 and Index.)

10 lb. cast lead-flats. (See § 2322.)

5 lb. milled-lead flashings 6 ins. wide. (See § 1711.)

6 lb. milled-lead 18 ins. wide to hips and ridges. (See § 1427.)

Eaves'-guttering of copper (if any.) (See § 1206 and Index.)

Eaves'-guttering of cast-iron (if any). (See § 1712.)

Lead rain-water-pipe. **2631. To provide and fix on the front and of the mansion, rain-water-pipes 5 ins. bore, turned up from mi lead, weight 8 lbs. to the foot superficial, and securely fixed, ornamental and moulded heads, with 2-in. strong overflow charging pipes.**

Cast-iron rain-water-pipes. 2632. To provide and fix to the office-buildings, st of cast-iron rain-water pipes 4-ins. bore, with large heads shoes complete: and to put to the lead pipes cast-iron pipes 3 bore, sufficient to extend 9 feet high from the surface of ground, and fixed with shoes complete.

2633. *No pipes of iron ought to be fixed against s work on account of the stains which the corrosion of iron cas*

Water-closets. (See Index.)

Cisterns. (See § 1211 and Index.)

Butler's sink. (See Index.)

Other sinks. (See Index.)

Pumps (if any). (See Index.)

Cold bath. 2634. To lay on the water to the cold-bath-room with cient strong lead 1¼ in. pipe, with a brass cock thereto; an put to the bath a 2½-in. strong lead water pipe, with a l washer and a plug thereto.

Hot bath. 2635. To fit up the hot-bath-room with a hot-bath of co weight 16 oz. to the foot superficial, tinned all over on the in thereof, and painted with japan-colour in imitation of Si marble; and to lay on the water thereto, and to put there waste pipe, and a cock, a water-plug, and all other proper fitt and appertenances, as described to the cold-bath.

(Baths being mostly fitted up with peculiarities ap

priate to each particular case, a more minute description of them is here unnecessary.)

Roses in gutters.

2636. To provide and place in each rain-water cess-pool, a hemispherical rose of 10 lb. lead, 6 ins. diameter, pierced with holes.

Copper nails.

2637. All the nails used in the lead-work are to be of copper.

GLAZIER.

Transparent plate-glass.

2638. To glaze the whole of the windows and lights of the dining-room, withdrawing-room, library, boudoir, entrance-hall, and of the best four bed-rooms, and of the five dressing-rooms, with the best clean and strong plate-glass bedded in putty and secured by mitred mouldings of French-polished Spanish mahogany, fixed by gilt-headed screws.

Venetian plate-glass.

2639. To glaze the lower squares of the windows of the office-buildings, with Venetian diapered plate glass.

Stained glass.

2640. To glaze the windows of the principal stair-case, and of the lobby to the with stained glass according to the drawings, accurately drawn and coloured, and with the ornaments thereof effectually burnt in.

Best Newcastle glass.

2641. To glaze all the remainder of the windows and lights throughout the buildings, with the very best clear Newcastle crown glass, properly bedded, bradded and back-puttied.

Cleaning, &c.

2642. The whole of the glazing is to be cleaned and left perfect immediately before the final rendering up of the buildings as complete.

PAINTER.

Preparation. (See § 1930.)

5 times in oil to iron-work. (See § 1931.)

4 times in oil to wood-work and stucco. (See § 1496.)

Flatting. (See § 1501.)

Imitation of wainscot. (See § 1497.)

Imitation of mahogany. (See § 1498.)

Varnishing. (See § 1500.)

Colours. (See § 1502.)

Distemper.

2643. To colour in distemper in the very best manner the

ceilings, cornices, centre flowers, beams, arches, coffered-work, and enrichments of the whole of the mansion, except such of the plasterer's work as is hereinbefore directed, to be whited, or coloured, or painted.

CHAPTER XXIII.

SPECIFICATION OF THE WORKS *to be done in taking down the present* **RECTORY-HOUSE,** *and in erecting and completing fit for occupation a* **NEW RECTORY-HOUSE** *in the parish of* , *in the county of Essex. (The Living of the said Rectory being of the annual value of* 400*l.*)

List of the Working-drawings referred to in this Specification. (See § 986.)

No. 1. The plan of the basement-story and foundations.
2. The plan of the ground-story.
3. The plan of the chamber-story.
4. The plan of the roofs.
5. The southern elevation.
6. The western elevation.
7. The eastern elevation.
8. The northern elevation.
9. Section from North to South through the house.
10. Details of the chimney-shafts and chimney-caps.
11. Details of the interior finishings of the house.

BRICKLAYER.

Take down present rectory-house.

2644. To take down and remove carefully the whole of the present rectory-house, including the kitchen and the cellar-story thereof, but leaving the dairy, the brew-house, the stable-offices, and other out-buildings, complete and free from damage as the same now are.

Digging, cartage, &c.

2645. To dig out for all the foundations, the basement-story, the drains, and wherever else may be requisite in order to execute and complete the buildings and works according to the design thereof; to render hard and level the bottoms of all the trenches, and to fill in and consolidate properly the ground about all the footings and brick-work when laid; the ground is not to rise beneath the ground-floors higher than 9 ins. below the sleepers.

2646. To remove, dispose of, and make up, the superfluous ground resulting from the excavations, in such manner round the new buildings and upon the glebe as shall be by the Architect directed.

Rubbish.

2647. To clear out from the building from time to time as by

occasion may be required, all rubbish which may arise from the performance of the various works, and finally leave the house and building clear therefrom. The rubbish is to be shot and spread upon the premises of the glebe in the manner which the Architect may direct.

neral brick-rk.

2648. To execute all brick-work requisite for carrying into effect the design of the buildings according to the drawings, and to render the whole house and premises with the offices and appertenances thereof complete and finished in every respect.

ugh arches.

2649. To turn rough arches and counter-arches wherever the same can be put, through the entire thickness of the respective walls, except where in certain instances it may be found expedient not to continue the arches through to the external surface of the work: all the external arches are to be finished with neat tuck-pointing.

ite brick ings and hes.

2650. To face with the best square hard-burnt and perfect white bricks (with all the heading bricks carried through into the body of the work in every possible instance), the whole of the external brick-work of the Southern, Western, and Eastern sides of the principal building with all the returns thereof; and to face in like manner all over all the chimney-shafts of the whole of the building: all the facings are to be finished with neat joints accurately struck.

2651. To put to the chimney-stacks, and to all the openings in the walls described to be faced with white bricks, gauged arches composed of hard white brick burnt clay wedges, accurately rubbed and set in the manner practised at Chelmsford and elsewhere.

2652. To execute in white bricks moulded in the clay according to the drawings, the several splays, quoins, dentil-cornices, mouldings, and other external decorations of the house.

her facings.

2653. To face all the remainder of the external brick-work with picked stocks of a light uniform colour with the joints thereof neatly struck and drawn.

imneys.

2654. To properly turn, parget, and core all the flues; to put to each fire-place on the ground-story (that to the study excepted), a brick fender 4 ins. thick for the support of the slab, with a foundation 6 ins. high and 9 ins. thick; to put to each of the other fire-places a 4-in. brick trimmer 12 ins. longer than the chimney-opening.

dding, &c.

2655. To bed in mortar, all the bond-timber, plates, lintels, wood-bricks, templets, and other timbers so requiring; to bed and point with lime and hair mortar all the door-frames and window-frames; and to back up with solid brick-work to all the timbers stone-work and other things to be set into the brick-work.

rains.

2656. To lay from the water-closet to the cess-pool of the present privy, a drain of strong earthen drain-pipes, 9 ins. internal

diameter; and to lay a drain of earthen drain-pipes 5 ins. bore, from the scullery to the 9-in. drain.

2657. To form at the feet of the soil-pipes and waste-pipes brick-funnels set in Parker's cement, and leading quite into the drains.

Piers under ground-floors.

2658. To put under all the sleepers of the ground floors, brick piers placed with the centre of one pier distant not more than 3 ft. 6 ins. from the centre of the next pier, and 4 courses high, the lower course being 9 ins. square, and the other three courses 9 ins. by 4½ ins.

Brick flat paving.

2659. To pave with hard stock-bricks laid flat in mortar, and grouted between the joints with liquid mortar, the whole of the basement story, the coal-cellar therein excepted.

½ rod extra brick-work.

2660. To provide under the contract one half of a rod reduced of the best stock brick-work, to be used in such extra works not intended to be done in the necessary work of the buildings, but in such extra works as the architect may direct, the value of such of the said extra brick-work as may not be directed to be used, is however to be deducted from the amount of the consideration of the contract, after the rate of per rod reduced, and the Contractor is to execute at the like price of per rod reduced, all such further extra brick-work as the architect may direct to be executed.

Bricks.

2661. The sound bricks in the present building may be used again in the new building after being properly cleaned, all the other bricks except the white facing-bricks are to be new approved hard-burnt square grey stock-bricks, free from breakage and from all admixture of soft bricks, place-bricks, or other inferior bricks.

Mortar.

2662. The whole of the mortar to be used in the work is to be compounded in the proportion of one third by measure of the best stone-lime, and two thirds by measure of clean sharp river sand (*or good road drift as the case may be*), properly beaten and worked up together.

Mode of doing the work. (See §§ 353—365, and 1010.)

2663. No four courses of work are to rise more than one inch besides the height of the bricks; all the foundation-works and other works not intended to be faced with white bricks, are to be carried up throughout their whole thickness with English bond, in order to prevent the bad union of two different kinds of bond.

Scaffolding, &c.

2664. To provide, maintain, alter as occasion may require, and finally remove, all scaffolding requisite for the performance of the whole of the works of every kind of the entire building, with sufficient poles, cords, ropes, planks, ladders, tackle, and other proper appertenances.

Jobbing-work.

(See § 1011.)

CHAPTER XXIII.

MASON. (See §§ 265—295.)

Basement stairs. 2665. To construct the basement internal and external stairs, with treads and risers of 3-in. tooled Yorkshire stone paving, wrought with fair edges, and properly pinned into the brick-work.

Steps and landing. 2666. To put to the porch, steps of rubbed solid Yorkshire stone, properly back-jointed and fix complete; and to form the pavement of the porch, upon an arch of 4-in. brick-work, of octagonal white paving tiles, and sawn slate, with a border of rubbed Yorkshire stone thereto, according to the drawings.

Cornices. 2667. To put to the front porch, and round the outside of the projection containing the water-closet and the Eastern entrance, cornices of the best Portland stone 6 ins. by 10 ins., moulded according to the drawings, and channelled and plugged with lead at all the joints thereof.

Wine-bins. 2668. To fit up the wine-cellar with two tiers of shelves of 3 in. Yorkshire stone, fairly tooled all over, and securely fixed.

Sink. 2669. To put in the scullery a sink of 7 in. Yorkshire stone, 2 ft. by 3 ft., cut out to receive the pipe and bell-grate.

Sills. 2670. To put to all the windows of the building, sills of Portland stone 9 ins. by 4 ins., sunk weathered, throated, and rubbed smooth all over.

2 marble chimney-pieces, &c. 5 guineas each chimney. 2671. To provide and fix in the dining-room and drawing-room, two marble chimney-pieces with slabs, value in the whole ten guineas, exclusive of the fixing and carriage.

Portland stone chimney-pieces. 2672. To provide and fix Portland stone jambs, mantles, and shelves, to all the other fire-places throughout the building, those of them to the kitchen-chimney to be of 2-in. Portland stone, each 8 ins. wide, and those of them to the other chimneys to be of 1¼-in. Portland stone, and 6 ins. wide; the chimney-piece of the study is also to have side slips of Portland stone, 3 ins. wide on both sides of each jamb.

Hearths and slabs. 2673. To put to each fire-place a hearth of 2½-in. rubbed Yorkshire stone; to put to the kitchen a slab of 2½-in. rubbed Yorkshire stone, 2 ft. wide; and to put to all the other chimneys of every kind throughout the building, except to the dining-room and drawing-room, slabs of 2-in. Portland stone each 18 ins. wide, and 12 ins. longer than the chimney opening.

Sundries. 2674. To work all requisite back-joints, rebates, fair edges, grooves and holes; to round off all corners where requisite; and to perform the other work and labour proper and usual in and about mason's work; and to complete the mason's work to the satisfaction of the architect.

SLATER. (See §§ 542—3.)

Countess slating.

2675. To slate the whole of the sloping parts of the roof over the house with the best strong countess slates.

Nails, bond, &c.

(See § 1024.)

Pointing.

2676. To point with lime and hair mortar the whole of the slating on the inside thereof.

Reparation.

2677. To repair and leave perfect to the satisfaction of the architect all the slating at the final rendering up of the works as complete.

CARPENTER AND JOINER. (See §§ 337—340.)

New materials, &c.

2678. To provide sufficient new materials for and frame and fix all carpenter's work and joiner's work of every kind which may be requisite for carrying into effect and for finishing in every respect the building and its appertenances according to the drawings, and to complete the same in every respect fit for occupation.

Timber and deals.

(See § 1031—2.)

Ironmongery.

2679. To provide and fix to the whole of the carpenter's work and joiner's work all proper and necessary nails, spikes, screws, and other sufficient ironmongery, and also all requisite brass-work. All the ironmongery and brass-work are to be of the very best quality.

Sundries.

2680. To provide and fix all requisite shores, struts, puncheons, oak-wedges, ties, cletes, beads, stops, fillets, tilting-fillets, backings, blocks, linings, casings, furrings, and rolls; to provide all moulds, rods, and patterns requisite for setting out and for executing all the various works; to fix all the iron-work; and to perform such rebating, grooving, tonguing, beading, scribing, chamfering, housing, jointing, framing, dove-tailing, planing, and other work and labour as may be found requisite for the perfect performance of and the thorough completion of the whole building and its appertenances.

Centering.

2681. To provide, fix, ease when so directed, and finally remove, centering and turning-pieces for all the gauged and rough arches and trimmers.

Bond-timber, &c.

2682. To put all round the brick-work of each story (above the basement-story) of the whole of the building one complete tier of fir bond-timber scantling 4 ins. by 2½ ins.

To put all wood-bricks requisite for receiving the ends of the templets and for such finishings as may so require.

Lintels. (See § 1041.)

2683. To put to all the windows and doors the requisite lintels of fir 4 ins. high by the width of the wall, and 15 ins. longer than the clear opening.

CHAPTER XXIII.

		Ins.	Ins.
Ground floors over the coal-cellar, larder, and office passage between the larder and the coal-cellar.	2684. Wall-plates	4 by	2½
	Fir joists	8 —	2
	Trimmers and trimming-joists	8 —	3
	1¼-in yellow deal ploughed and tongued boarded floors listed free from sap-wood.		
Floor of the entrance-hall and stair-case.	2685. Joists	6 —	2
	Trimmers and trimming-joists	6 —	2½
	1-in. ploughed and tongued yellow deal boarded flooring listed free from sap-wood.		
Flooring to the remainder of the ground story.	2686. Oak sleepers not more than four feet apart.	4 —	3
	Fir joists	4 —	2
	1-in. yellow deal straight-joint boarded flooring of half boards listed free from sap-wood.		
Floors of the best two chambers.	2687. Wall-plates	4 —	4
	Joists	10 —	2
	Trimmers and trimming-joists	10 —	2½
	One tier of herring-bone struts down the middle of the flooring of each room.		
	Boarded floor formed of the best of the flooring-boards of the present house, gauged to a similar width laid with straight-joints and made complete with all requisite work and new materials.		
Floors to the three northern chambers.	2688. Wall-plates	4 —	4
	Joists	8 —	2
	Trimmers and trimming-joists	8 —	2½
	Boarded flooring composed of the present boarded floors of the house, gauged to the same width, laid with straight-joints and made complete with all requisite work and new materials.		
Remainder of the one-pair flooring.	2689. Wall-plates	4 —	2½
	Six binders within the plaster beams of the hall-ceiling.	7 —	4½
	Joists	4½ —	2
	Trimming-joists	4 —	2½
	Inch white deal boarded floor of half boards. If any of the boarded floorings of the present house remain sound and to spare after completing the floors above described, the same may be used for completing the flooring of the one-pair story of the new house instead of new deal.		
Roof.	2690. Wall-plates	4 —	4
	Four tie-beams	10 —	3½
	Angle-ties each 5 ft. long	4 —	2½
	Dragon-pieces	4 —	2
	Rafters (two thirds thereof formed out of the sound timbers of the present house)	6 —	2
	Hips and ridges rounded for lead	9 —	1¼
	Valley-pieces	8 —	3
	Joists for flat, average	6 —	2
	Inch yellow deal boarding for the lead-work with furrings 1½-in. current to every 10 ft.		

¾-in. yellow deal slate-battens 2 ins. wide.
¾-in. deal fear-boards 10 ins. wide.
All requisite tilting-fillets and fittings complete.
Inch yellow deal tongued and beaded fascia 6 ins. wide, and ¾-in. yellow deal soffit.
Ceiling-joists spiked in one length beneath the tie-beams ... ... 3 — 2

2691. To put in the roof a dormer complete with strong framing and with inch deal ploughed tongued beaded and ledged outer door, 1¼-in deal square framed inner trap-door, inch deal linings, slate-battens bolts hinges and all other proper fittings and appertenances.

Cradling.

2692. To form out the ceiling over the entrance-hall into panels according to the drawings, with cradling of yellow deal securely fixed.

Angle staves.

2693. To put to all the projecting angles of the internal brick-work, proper rebated angle-staves, those used in the stucco-work and in the dining-room and drawing-room and study are to be headed.

Quartered partitions to inclose the dressing-room, &c.: all the other apartments are inclosed by brick walls.)

2694. Sills	...	...	...	...	...	Ins. 4 by 3
Upper plates	...	...	...	...	...	4 — 3
Collar-plates above the doorways			...	...	...	4 — 3
Door-posts and angle-posts	...	...	...	...	...	3 — 4
Braces framed at bottom into the sills, and at top into the posts	...	...	...	...	...	3 — 3
Two tiers of inter-ties to each story	...	...	...	...	...	3 — 1½

Wall wainscotting.

2695. To put all round the walls of the nursery the dwarf wainscotting of the large parlour of the present house, repaired, altered, adapted, and made complete with the requisite new materials and appertenances.

Skirting.

2696. To skirt the dining-room and the drawing-room with moulded skirting, with proper grounds and backings according to the drawings.

To skirt with ¾-in. yellow deal square skirting 6 ins. high, plugged to the walls, all the remainder of the rooms, passages, and other parts of the building intended to be plastered.

Window

2697. To fit up the three northern windows on the one-pair story of the house, with three of the best of the windows of the present house, repaired thoroughly, and with the sashes thereof re-hung with large patent lines and the other requisite work and fittings and made in all respects complete.

2698. To fit up all the remainder of the windows of the house with 1½-in. yellow deal ovolo sashes, double hung with the best large patent lines, iron axle-pulleys, patent spring fastenings and iron weights in deal-cased frames with English oak sunk sills

Shutters

2699. To fit up the windows of the dining-room and drawing-room with 1¼-in. shutters two panels high, the fronts of

the front shutters framed and moulded to correspond with the doors of the same rooms and all the remainder of the shutters framed square, hung in two heights with strong spring shutter-bars and with 1½-in. proper boxings sunk and finished with mouldings to correspond with those of the architraves round the doors; inch deal square framed back linings two panels high, 1¼-in. moulded one-panel backs, elbows, and soffits, to correspond with the doors, beaded capping and elbow-caps, and all other requisite fittings complete.

2700. To fit up the window of the study with 1½-in. sliding shutters framed square each in three panels, hung in deal cased-frames with mouldings round the same to correspond with the door-architraves, and with lines weights and pulleys, the same as described for the sashes; to put to the same window an 1¼-in. deal window-back to correspond with the shutters, with beaded cappings thereto hung with hinges; and to put to the shutters brass thumb-screws.

2701. To fit up all the remainder of the windows with inch deal tongued and double quirked beaded linings; and to put to the kitchen-window, shutters composed of the shutters of the present house altered adapted and hung complete with the requisite fastenings work and appertenances.

n. doors and light.

2702. To put to the two principal external doorways, 2½-in. lamb's tongue sashed doors moulded in front and square at the back, with inch deal panels, and hung each with three 4-in. butt-hinges and with other ironmongery in addition thereto value 12*s.*; and to put thereto 1½-in. deal bead-flush and square-framed shutters with wrought-iron corner-shoes and thumb-screws. To put over the principal external doorway a 2-in. deal moulded semi-circular-headed fan-light.

. doors and lights.

2703. To put to the other external doorways of the house, 2-in. four-panel bead-flush and square-framed doors hung each with a pair of 4-in. butt-hinges, and with other ironmongery in addition thereto value 10*s.*; and to fit up over the same external doors next the kitchen-court with fan-lights composed of the windows of the present house repaired adapted and made complete.

2704. To fit up the dining-room and drawing-room with 2-in. deal doors, moulded towards the rooms, the folding-doors hung with three pairs of 4-in. butt-hinges, a best mortise-lock with plain brass furniture, and two brass flush bolts, one thereof 8 ins. long and the other thereof 3 ft. long; the other doors hung each with a pair of 4 in. butt-hinges and a best mortise-lock with plain brass furniture.

n. closet doors.

2705. To fit up all the closets with 1¼-in. four-panel doors with ¾-in. deal panels hung with 3-in. butt-hinges and 4-in. strong closet-locks, the doors to the closets of the dining-room and drawing-room are to be moulded in front and to have furniture to correspond with the other moulded doors; all the other closet-doors are to be framed square on both sides.

1½-in. doors.

2706. To put to all the remainder of the doorways on the ground-story and one-pair story of the house, 1½-in. deal four-panel square framed doors with ¾-in. deal panels, hung each with a pair of 3-in. butt-hinges and a best 7-in. iron-rimmed lock with plain solid brass furniture.

2707. To fit up the doorways of the basement-story with some of the best of the doors of the present house, repaired, altered, adapted, hung with new 3-in. butt-hinges, and made complete with new 7-in. best copper-warded stock-locks and all other proper work and appertenances.

Door-linings.

2708. To fit up all the doorways of the building with 1½-in. framed tongued and rebated linings, those thereof more than 10 ins. wide paneled and finished to correspond with the respective doors hung therein, but each jamb and each soffit being framed in only one panel.

Door-cases.

2709. To put to the basement doorways and to the external doorways on the ground-story, proper door-cases 4 ins. by 4 ins. those to the basement-story being of oak.

Architraves, &c.

2710. To put on both sides of all the doors above the basement-story throughout all the building, inch yellow deal grooved grounds, those thereof next the entrance-hall to be 6 ins. wide and all the remainder 4½ ins. wide; to put all round all the doors in the dining-room and drawing-room, moulded architraves 6 ins. wide according to the drawings; and to put all round on both sides of all the other doors throughout the whole building, mouldings to correspond with the mouldings of the architraves.

Principal staircase.

2711. To construct the stair-case leading from the entrance-hall to the one-pair story according to the drawings, with 1½-in. clean yellow deal feather-tongued risers treads and landings on very strong bracketed carriages and with moulded returned nosings, 1½-in. string-boards, 1½-in. beaded sunk and mitred outer-strings, 1-in. deal apron-linings, best Honduras mahogany large moulded circular and ramped hand-rail with large scroll to the curtail-step; and dove-tailed bar balusters 1 in. square, every tenth baluster being of wrought-iron.

Basement staircase.

2712. To inclose the head of the basement internal stair-case, by an 1½-in. square framed spandril-partition with panels of ¾-in. deal not more than 10 ins. wide, and with a four-panel door therein to match the partition, hung with a pair of 3-in. butt-hinges and with two 8-in. barrel-bolts.

2713. To form over the head of the basement external stairs, a bulk-head of 1½-in. deal ploughed and tongued together, and fixed with sufficient strong bearers: the bulk-head is to be constructed in steps or gradations, so as for the top of it to form shelves within the pantry.

Closets.

2714. To fit up and inclose the several closets and other parts of the house, where requisite, with 1½-in. deal square-framed partitions and inclosures with ¾-in. deal panels not more than 10 ins. wide

2715. To fit up the closets on the inside thereof each with three tiers of inch deal shelves as wide as the closet will admit of, except where otherwise shown by the plans, and fixed with the requisite bearers.

Cistern, &c.

2716. To form the ceilings of the water-closet and adjoining lobby with plates 4 ins. by 4 ins. and joists 6 ins. by 3 ins., and lay the joists with 1¼-in. yellow deal to serve as a bottom to the cistern to be formed over the same; and to cover over the cistern with a lid made of inch yellow deal ploughed, tongued, and ledged, having a large saddle-back fillet and four water-grooves to each joint thereof, and laid upon strong bearers and with a trap-door therein hung with strong hinges.

Water-closet.

2717. To fit up the water-closet with inch fine Honduras mahogany framed and moulded riser and clamped and moulded flap and frame, inch pencil-cedar seat; ½-in. Honduras mahogany skirting over the seat, all requisite strong bearers, 1¼-in. yellow deal pipe-casings with strong rebated and beaded grounds, hinges, buttons, and other fastenings complete; to attend upon the plumbers while fixing the pipes and apparatus, to cut holes, and find and perform all other needful work and labour for making the water-closet complete.

Kitchen dresser, &c.

2718. To put in the kitchen a dresser with drawers, shelves, pot-board, and fittings complete, value four pounds.

Jobbing-work.

2719. To perform to the whole of the buildings and works and to their appertenances, all such carpenter's work and joiner's work as may be requisite thereto in the nature of jobbing.

20 cubic feet fir extra.

2720. To provide and fix under the contract twenty cubic feet of the best Baltic yellow fir timber (in addition to the timber fully necessary for the completion of the work) to be used in such additional rafters, quarters, joists, or other framed and unplaned timber-work as the architect may direct, the value of all such of the said extra fir timber as may not be ordered by the architect to be used is however to be deducted from the amount of the consideration of the contract after the rate of per foot cube; and all additional fir timber of the kinds above described which may be ordered by the architect to be used is to be taken at the like price of per foot cube.

SMITH.

Chimney-bars.

2721. To provide and fix to each of the fire-places a wrought-iron chimney-bar 1½ in. by ½-in. properly corked at the ends thereof.

Air-grates.

2722. To provide 13 cast-iron air-gratings 9 ins. square, and to fix the same round the lower part of the walls of the house.

3 cwt. ties, &c. (See § 1277.)

2723. To provide 3 cwt. of iron in such ties, bolts, nuts, screws, straps, and other light wrought and hammered work as may be by the architect directed.

PLASTERER.

L. P. F. S. ceilings, &c.

2724. To lath, plaster, float, and set ceilings and strings to the whole of the ground-story and to the whole of the one-pair story of the house.

Troweled stucco.

2725. To execute all the sides of the principal stair-case, entrance-hall, and the lobbies therewith connected, with the best floated troweled stucco, lathed where requisite.

L. P. F. S. sides.

2726. To lath, plaster, float, and set all the quartered-partitions of the building.

R. P. S.

2727. To render, float, and set all the remainder of the internal brick-work of the building, that to the basement-story excepted.

Cornices, &c.

2728. To execute according to the drawings plain cornices to the dining-room and drawing-room, and to the entrance-hall; and to form in the ceiling of the entrance-hall the appearances of beams, so that the cornice may run round the compartments of the ceiling and form the same into panels.

Sundries.

2729. All the requisite lathing and counter-lathing is to be performed; all the laths are to be of heart of fir.

2730. To execute all requisite beads, quirks, and arrises; to stucco all the internal reveals; to perform all requisite dubbing out; to find all additional thicknesses; and to form all needful mitres.

Whiting.

2731. To whiten all the ceilings, strings, and plaster cornices throughout the house.

Colouring.

2732. To colour of a teint of stone-colour as shall be directed the plastered walls and sides of the kitchen, pantry, and china-closet, and of all the other plastered parts of the house which are not intended to be papered.

PLUMBER.

6½-lb. milled-lead gutters, flat, and valleys.

2733. To lay the flat, chimney-gutters, and valleys with the best milled-lead, weight full 6½ lbs. to the foot superficial, turned up full 6 ins. against all brick-work and other perpendicular sides and full 10 ins. high against the rafters; and the lead to the valleys is to be full 20 ins. wide.

4-lb. milled-lead flashings.

2734. To put flashings of 4 lb. milled-lead 5 ins. wide round all the chimney-gutters and to the flats where requisite.

[redacted]

HAPTER XXIII.

milled-lead ips and ridges.

2735. To cover all the hips and ridges with 4 lb. milled-lead 16 ins. wide, effectually secured.

ves'-guttering.

2736. To put all round the projecting eaves of the house 4-in. semicircular cast-iron eaves'-guttering, fixed on sufficient strong wrought-iron brackets, and jointed with white-lead.

W. P.

2737. To put from the eaves'-guttering to the cistern two stacks of cast-iron rain-water pipes 2½ ins. bore, with neat heads of approved pattern, and fixed complete.

ater-closet. e Index.)

2738. To fit up the water-closet with the very best pan water-closet apparatus with blue basin, S trap, 5-in. soil-pipe of 10 lb. lead, soil-box, ¾-in. service-pipe, air-pipe, warning-pipe, and all other requisite fittings, work, and appertenances of the most complete description.

istern.

2739. To line with lead the cistern, the bottom thereof with cast-lead 10 lbs. to the foot superficial, and the sides thereof with milled-lead 5 lbs. to the foot superficial; to lay on the water to the sink in the scullery with sufficient ¾-in. strong service-pipe with cock and other proper fittings complete, and to put to the cistern a strong 1¼-in. waste-pipe.

Sink, &c.

2740. To put from the scullery-sink to the drains a 2-in. strong waste-pipe with a brass bell-grate thereto.

l cwt. extra lead-work.

2741. To provide under the contract 1 cwt. extra of milled-lead work, including labour and all proper materials to be used in such additional works as the architect may direct, deduction however is to be made for the same if not used after the rate of per cwt. including the labour and all materials in fixing the same, and all additional lead-work is to be taken at the like price of per cwt.

PAINTER.

Paration.

2742. To knot with silver leaf, stop, pumice and smooth in every part, and prepare properly in the most perfect manner, all the wood-work and other works intended to be painted.

ur times in oil.

2743. To paint four times in good oil-colour all the internal and external wood-works and iron-works, all the stucco, and all the other works, where all the said works are usually painted.

atting.

2744. To flat extra of such teints of stone-colour as may be by the architect directed, the whole of the stucco-work and all the wood-work of the ground-story (that to the kitchen, office-passage, pantry, china-closet, store-closet, and the insides of the other closets, excepted) and of the stair-case, passage, and lobby of the one-pair story, and also of the two Southern chambers; the work of the dining-room and of the drawing-room is to be finished in three teints.

Mineral colours.

2745. The sashes are to be finished on the outside thereof with dark purple brown; the other plain painting is to be in general finished of such teints of stone-colour, drab, brown, or other plain colours as may be by the architect directed.

GLAZIER.

Best glass.

2746. To glaze all the windows of the dining-room, of the drawing-room, of the best two chambers, of the entrance-hall, and of the stair-case, with the best Newcastle crown glass.

Second glass.

2747. To glaze all the remainder of the windows and lights throughout the building with good clear second Newcastle crown glass.

Cleaning, &c.

2748. The whole of the glazing is to be properly bedded, bradded, and back-puttied, and is to be cleaned and left perfect at the final rendering up of the works as complete.

Old glass.

2749. Any of the glass of the present house which may answer the description given above may be used again in the windows of the new house.

PAPER-HANGER.

Preparation.

2750. To prepare properly all the walls and surfaces intended to be papered, and to bring the same out to a proper face.

Dining-room and drawing-room 9*d.* per yard underlined.

2751. To underline with strong paper and hang with figured paper value 9*d.* per yard, cut close round the edges thereof, the whole of the sides of the dining-room and of the drawing-room.

Study and best two bed-rooms and dressing-rooms 4*d.* per yard.

2752. To hang with figured paper, value 4*d.* per yard, cut close round the edges thereof, the whole of the sides of the study, those of the best two chambers, those of the dressing-rooms, and those of the closets thereto attached.

Other paper 2*d.* per yard.

2753. To hang with figured paper, value 2*d.* per yard, cut close round the edges thereof, the whole of the remainder of the chambers on the one-pair story, and all the closets thereto attached.

Patterns.

2754. The contractor is to provide sufficient patterns of good quality, for the rector to choose therefrom the figures of the paper-hangings.

CHAPTER XXIV.

BELL-HANGER.

2755. To provide and fix with cranks, wires, pulls, and all other proper work and appertenances of the best quality the following bells.

Two door-bells fixed in the office-passage, one thereof with a brass-pull at the side external gate of the office-court, and the other thereof with a brass-pull in the front porch.

Three bells in the office-passage, with neat brass lever-pulls, one thereof in the dining-room, another thereof in the drawing-room, and the other thereof in the study.

One bell in the office-passage with a pull in the best chamber.

One bell in the servant's chamber with a pull in the best chamber.

CHAPTER XXIV.

SPECIFICATION OF THE WORKS *to be done in erecting and completing fit for occupation a* RECTORY-HOUSE *at* . *(The Living attached to the which Rectory-house is of the value of* 800*l. per annum.)*

(Insert here a list of the Working-drawings. See § 986. *)*

BRICKLAYER. (See §§ 2644—5.)

Digging, cartage, &c.

2756. To remove, dispose of, and make up the superfluous ground resulting from the excavations, in such manner round the new buildings as shall be by the architect directed.

Rubbish.

(See § 2646, 7.)

General brick-work.

(See § 2648.)

Rough arches.

(See § 2649.)

White brick facings and arches. (See §§ 358—60 and 867.)

2757. To face with the best white bricks, with the heading-bricks carried through into the body of the work in every possible instance, the whole of the external brick-work of the South-west and East sides of the principal building, with the returns thereof, and the whole of the South and East sides of the office buildings, with the returns also thereof; and to face in like manner all over all the chimney-shafts of the whole of the buildings: all the facings are to be finished with neat joints accurately drawn.

(See § 593.)

2758. To put to the two chimney-stacks, and to all the openings in the walls described to be faced with white bricks (except

to those thereof which are intended to have stone dressings), gauged arches composed of white brick-burnt clay wedges accurately rubbed and set in the manner practised in the county of Essex and elsewhere.

Other facings.

2759. To face all the remainder of the external brick-work with picked stock-bricks of uniform colour, with the joints neatly struck and drawn.

Chimneys.

2760. To properly turn parget and core all the flues; to put to each fire-place on the ground-story a brick fender 9 ins. thick, in order to support the chimney-slab; to put to each of the other fire-places a 4-in. brick trimmer 18 ins. longer than the chimney-opening.

Bedding, &c.

(See § 2655.)

Brick-nogging.

2761. To brick-nog all the partitions round the water-closets.

Drains.

2762. To form one hundred feet run of barrel drain, 14 ins. internal diameter in 4½-in. brick-work, stuccoed over the lower half thereof, ¾-in. thick with pure quick Parker's cement.

2763. And to form one hundred feet run of brick-drain 6 ins. square, laid in Parker's cement.

2764. To form at the foot of each rain-water pipe, soil-pipe, and waste-pipe, a brick-funnel set in Parker's cement, and leading quite into the drains. (See § 1104.)

2765. To form other drain-work in value 10*l.*, besides that above described.

To construct to each of the privies a cess-pool, 6 ft. deep and 3 ft. 6 ins. internal diameter, steined round with 4 in. dry brick-work. (See §§ 1003, 4.)

Piers under ground floors.

2766. To put under all the sleepers of the ground-floors brick piers, the centre of one pier distant not more than 3 ft. from the centre of the next pier, and each pier four courses high, the lower course of brick-work being 9 ins. square, and the other three courses 9 ins. by 4½ ins.

Brick flat paving.

2767. To pave with the hardest stock-bricks laid flat in mortar, and grouted also with mortar between the joints, the whole of the larder, the scullery, the coal-house, the knife-house, the shed between the privies, and the whole of the basement story.

Three rods extra brickwork.

(See § 1007.)

Bricks.

2768. All the bricks except the white facing-bricks are to be the best new approved hard-burnt square grey stock-bricks, free from breakage, and from all admixture of soft bricks, place bricks, or other inferior bricks.

Mortar

2769. The whole of the mortar is to be compounded in the proportion of one third by measure of the best stone-

lime, and two thirds by measure of clean sharp river sand, properly ground in a mill.

2770. *The mortar used in any considerable work, should be ground in a mill: when the dimensions of a work are such as to create no additional expense by the use of a mill, any additional dimensions to the building will cause a saving in the ratio of the price of labour by the use of such a mill.*

Mode of doing work. (See §§ 355—363 and 1010.)

2771. No four courses of work are to rise more than one inch besides the height of the bricks, all the foundation-works and other works not intended to be faced with white bricks are to be carried up throughout their whole thickness with English bond, in order to prevent the bad union of two different kinds of bond.

Scaffolding, &c.

2772. (See § 2664.)

Mathematical tiles.

2773. To cover the perpendicular South fronts of the attic with mathematical tiles, to match in colour and workmanship, the white brick facings of the building.

[This clause is given as a specimen, but the use of this description of covering is not to be recommended, except on old external wood inclosures.]

MASON. (See §§ 265—295.)

YORKSHIRE STONE.

100 ft. 2½-in. Yorkshire stone provision.

2774. To provide and apply in the various parts of the building, as shall be by the architect directed, one hundred feet superficial, of 2½-in. tooled Yorkshire stone paving, properly jointed and set.

Corbeilles.

2775. To provide and fix corbeilles of 6-in. Yorkshire stone landing, for the support of all the projecting chimney-jambs. (See § 1267.)

Basement stairs.

2776. To construct the basement-stairs with treads and risers of 3-in. tooled Yorkshire stone paving, wrought with fair edges, and properly pinned into the brick-work.

2½-in. Yorkshire stone paving to covered-way and passage.

2777. To pave the covered-way in the office-court, and the passage from the kitchen thereto, with tooled Yorkshire stone, not in any part thereof less than 2½ ins. thick, and close jointed, and in regular courses.

Rubbed stone steps and landings.

2778. To put to the portico, to the external recess adjoining to the outside of the store-room, and to all the external doorways of every kind, 6-in. landings and steps, all of rubbed Yorkshire stone, properly back-jointed and fixed complete.

Wine-bins.

2779. To fit up the wine-cellar with divisions, and two tiers of shelves of 3-in. Yorkshire stone, fairly tooled all over and set in Parker's cement.

Sinks.

2780. To put in the scullery, a sink of 7-in. Yorkshire stone, 2 ft. 6 ins. by 3 ft. 6 ins., cut out to receive the pipe and bell-grate: and to provide and fix where the architect shall direct, four five-hole sink-stones, each sunk out of a piece of 4-in. Yorkshire stone 15 ins. square.

SAND STONE.

(This building was erected adjoining to sand-stone quarries, which formed the reason of the use of this description of material.)

2781. To execute according to the drawings in solid sand-stones from the quarry at , selected of the very best quality, in the largest possible pieces, of uniform colour, free from stains vents veins shakes seams and all other defects of every kind, all the following works:—

Plinth.

2782. A plinth all round the outside of the whole of the buildings, 1 ft. 4 ins. high, and 9 ins. thick, with rubbed face and joints, and sunk and rubbed top 2 ins. wide; and with quoin-stones returned not less than 18 in.: this plinth is not to be cramped.

Pilasters, entablatures, &c.

2783. The pilasters and entablatures to the principal entrance, and between the two bows of the South-front, according to the drawings at large, and rubbed all over: the horizontal joints are to be all set in 5 lb. milled-lead, the vertical joints are to be secured by copper cramps, each weight not less than 12 oz.; each pilaster-shaft and each architrave is to be in one solid piece of stone.

Window-dressings.

2784. The architraves, friezes, cornices and trusses, according to the drawings at large, to the six lower windows of the bow-fronts; and the friezes, cornices, and blocks to the seven windows on the one-pair story of the South-front. The whole of this work is to be rubbed all over.

Window stools, &c.

2785. The pedestal under the centre lower window of the South-front, according to the drawings; and the external window-stools of the six lower windows of the bow-fronts, each in one piece of stone 1 ft. 9 ins. high and 6 ins. thick, rubbed all over, with weathered top, and sunk and moulded panel in front.

Sills.

2786. Sills to all the other windows, and to the blank window-recesses throughout the buildings, of solid stone 9 ins. by 6 ins., sunk, weathered, throated, and rubbed all over.

Cornice blocking, &c. to South front.

2787. The cornice to the south front and to the returns thereof, of stone in as long pieces as possible 10½ ins. by 2 ft., sunk and weathered on the top, and with the joints therein channeled and plugged with lead, moulded and rubbed all over, the blocking above the cornice of solid stone 18 ins. high and 8 ins. average thickness, rubbed all over, and secured at the joints by copper cramps each weight 12 oz.; the balusters, impost and pedestal over the centre of the principal front, rubbed all over, joggled together, and run with lead.

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Flank pediments. 2788. The cornices to the two flank pediments of solid stone 6 ins. by 14 ins., rubbed all over, and secured at all the joints thereof by copper cramps each weight 12 oz. and with solid quoins.

Chimney-caps. 2789. A cap to each chimney-shaft of the building, in one piece 4 ins. longer and 4 ins. wider than the shaft and 9 ins. thick, sunk, throated, rubbed all over, and with holes cut through the same for the flues.

To provide and fix chimney-pieces and slabs as follow :—

3 chimney-pieces 12 guineas each. 2790. A marble chimney-piece with a slab, to each of the best rooms on the ground story, value twelve guineas exclusive of the fixing and carriage thereof.

3 chimney-pieces 6 guineas each. 2791. A marble chimney-piece to each of the best three chambers, value six guineas exclusive of the carriage and fixing thereof.

Portland stone chimney-pieces. 2792. Portland stone jambs mantles and shelves to all the other fire-places throughout the buildings, those to the kitchen-chimney to be of 2 in. Portland stone and each 8 ins. wide, those to all the other chimneys to be of 1½-in. Portland stone and 6 ins. wide.

Hearths and slabs. 2793. A hearth of 2½-in. rubbed Yorkshire stone to each fire-place : a slab of 2½-in. rubbed Yorkshire stone 2 ft. wide to the kitchen ; and to put to all the other chimneys of every kind throughout the buildings, except to the best three rooms, slabs of 2 in. Portland stone each 18 ins. wide and 12 ins. longer than the chimney-opening.

Chimney-pots. 2794. To provide and fix over each flue of the entire building, an ornamental chimney-pot of Coade's terra-cotta or artificial stone properly modeled according to the drawings.

Cleaning off stone-work, and sundries. 2795. To clean off, shortly before the final rendering up of the works as complete, all the stone-work of every kind ; to take out and re-place every stone which may then appear in any way defective : to provide all requisite bond-stones, lead plugs and copper cramps ; to work all requisite back-joints, rebates, fair-edges, grooves and holes ; to round off all corners where requisite ; and to perform the other work and labour proper and usual in and about mason's work and to complete the mason's work to the satisfaction of the architect.

SLATER. (See §§ 542—3.)

Duchess slating. 2796. To slate the flat roofs over the South attic windows, with the best strong Duchess slates.

Countess slating. 2797. To slate all the remainder of the roofs of the whole of the building, with the best strong Countess slating.

Nails, bond, &c. (See § 1024.)

Pointing. 2798. To point the whole of the slating on the inside thereof with stone-lime mortar with sufficient hair therein.

Reparation. 2799. To repair and leave perfect to the satisfaction of the architect, all the slating at the final rendering up of the works as complete.

CARPENTER AND JOINER. (See §§ 337—40.)

New materials, &c. (See § 2678.)

Timber and deals. (See § 1031—2.)

Ironmongery. (See § 2679.)

Sundries. (See § 2680.)

Centering. 2800. To provide, fix, case when directed, and finally remove, centering and turning-pieces for all the gauged and rough arches and trimmers.

Casing to stone-work, &c. 2801. To case up all the stone-work and the angles of the brick-work in manner sufficient to preserve the same from injury during the carrying on of the works.

Bond timber, &c. 2802. To put all round the brick-work of each story (above the basement-story) of the whole of the buildings, two complete tiers of fir bond-timber scantling 4 ins. by 2¼ ins.; to put all round the external brick-work of the ground-story of the main building, two tiers of similar bond-timber in addition to the bond-timber last described; and to put all round the external brick-work of the one-pair story of the main building one tier in addition of similar bond-timber.

To put all wood-bricks requisite for receiving the ends of the templets and for such finishings as may so require.

Lintels. (See § 1041.) 2803. To put to all the windows and doors the requisite lintels 5½ ins. high by the width of the wall and 15 ins. longer than the clear opening.

Ground-floors. Over the cellars. (See §§ 1281 and 324.)

	Ins.	Ins.
2804. Binding-joists not more than 4 ft. apart ...	10	by 6
Ditto within 6 ins. of the walls	10	— 3
A cast-iron socket weight 28 lbs. on each end of each binding joist to prevent the ground from rotting the timber.		
Joists bridged above the binding joists...	4	— 2
Trimmers to ditto	4	— 2¼
1¼-in. ploughed and tongued yellow deal boarded flooring listed free from sap-wood.		

To the remainder of the story.

2805. Oak sleepers not more than 4 ft. apart ...	4	— 3
Oak joists	4	— 2
1¼-in. yellow deal straight-joint boarded flooring listed free from sap-wood.		

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		Ins.	Ins.
One-pair floors of the principal building.	2806. Wall-plates	6	— 6
	Joists	11	— 2¼
	Trimmers	11	— 3
	Two tiers of herring-bone struts down the flooring of each room.		
One-pair floors to remainder of building.	2807. Inch white deal straight joint-boarded flooring.		
	Wall-plates	6	— 4
	Joists	9	— 2¼
	Trimmers	9	— 3
	One tier of herring-bone struts down the middle of each room.		
	Inch white deal folding flooring.		
Attic floors, trusses, &c.	2808. Girders or tie-beams	12	— 6
	Principals...	6	— 6
	Queen-posts	7	— 6
	Collars	6	— 6
	Binding-joists framed into the tie-beams and not more than 5 ft. apart	10	— 6
	Joists corked above the binders	5	— 2
	Ceiling-joists spiked each in one length beneath the binders	2	— 1½
	Boarded flooring of inch white deal laid folding.		
Roof over the main building.	2809. Wall-plates	6	— 6
	Rafters	6	— 2¼
	Head plates	10	— 4
	Hips rounded for lead	10½	— 2
	Valley-pieces	8	— 3½
	Joists for flat, average	10	— 2½
	Inch yellow deal boarding for the lead-work, furrings 1½ in. current to every 10 ft., 2½-in. drips so disposed as that the sheets of lead may not be longer than 15 ft., rolls for the seams of the lead, inch yellow deal sunk gutters to the flat, chimney-gutters and South gutters with framed bearers drips and currents the same as to the furrings.		
	¾-in. yellow deal slate-boarding to the flattest parts of the roof over the two bows and ¾-in. yellow-deal slate-battens 2¼-in. wide to all the remainder of the roof.		
	All requisite tilting-fillets and fittings complete.		
	Strong bracketing all round the projecting eaves with inch yellow deal tongued and beaded fascia 6 ins. wide and 1½-in. yellow deal soffit framed into square sunk panels ¾-in. deep.		
	¾-in. yellow deal lear-boards 10½ ins. wide where requisite.		
Flats over the bows.	2810. Wall-plates	6	— 6
	Joists notched out at the ends to form gutters ...	8	— 2
	Furrings to form current 1½-in. to every 10 ft., inch yellow deal gutter and boarding for lead, rolls		

for the seams of the lead-work, and all fittings complete.

Two trusses, &c. to support the backs of the flats over the bows and upon which the fronts of the attics are to be formed, and the dressings thereto.

	Ins.	Ins.
2811. Tie-beams	12	— 6
Principals	6	— 5
Collars	6	— 5
Queens	6	— 6
Angle-posts	6	— 5
Long plates above the collars	6	— 4
Oak framed weathered and throated sills filled in between the queens	10	— 4½
Muntins above the oak sills	6	— 3
Quarters filled into the trusses round the windows ...	6	— 2

Yellow deal moulded cornices to the two pediments.
1¼-in. yellow deal dressings to the windows.

Roof over the scullery, larder, and passage.

2812. Wall-plates	4	— 4
2 angle-ties each 5 ft. long	4	— 3
2 dragons each 3 ft. long	4	— 2
2 ties	6	— 2½
Rafters	4	— 2
2 hips rounded for lead	1¼	— 8

1-in. soffit-board of yellow deal 4 ins. wide.
¾-in. yellow deal slate-battens 2½-ins. wide.

Roofs over the covered way, knife-house, wood-house, coal-house, shed, and privies.

2813. Wall-plates	4	— 4
Wrought breast-summers and ties	8	— 4
4 wrought angle-ties each 4 feet long	4	— 2½
Head plates	4	— 2½
Rafters (wrought smooth)	3	— 2
2 wrought valleys	4	— 4

¾-in. yellow deal slate-boarding clear of sap-wood.
¾-in. yellow deal lear-boards 10 ins. wide where requisite.

(See § 1282.) Oak turned columns 6 ins. diameter at bottom 5 ins. diameter at top, with moulded capitals, and with socket-bases of cast-iron each weight 14lbs.

Roof over the one-pair story of the remainder of the building.

2814. Wall-plates	5	by 4
3 ties	8	— 3½
5 angle-ties each 5 ft. long	5	— 3
One dragon-piece 3 ft. long	5	— 2½
Ridges and one hip rounded for lead	1¼	— 8½
Rafters to the widest span	4½	— 2
Ditto to the narrowest span	4	— 2
Valley	7	— 4

Inch yellow deal soffit-board 6 ins. wide.
¾-in. yellow deal slate-battens 2½ ins. wide.
Ceiling-joists spiked in one length beneath the ties ... 3 — 2

Battening, &c.

2815. To batten all the external brick-work of the main building with ¾-in. yellow deal 2½ ins. wide not more than 12 ins. apart.

To batten out the attic story round the feet of the rafters as shown by the drawings, with fir quarters 3 ins. by 2 ins. not more than 12 ins. apart.

[redacted]

HAPTER XXIV.

lling.

2816. To put for the groined ceilings over the entrance-hall and over the lobby adjoining to the principal staircase, cradling with ribs in two thicknesses of inch yellow deal, and all requisite struts, braces, and other proper appertenances.

le staves.

2817. To put to all the projecting angles of the internal brickwork proper rebated angle-staves; those used in the stucco-work are to be beaded.

rtered-partis. (See §§ —550, and —2.)

2818. Plates carried below the door-ways wherever possible ... ... 4½ by 4
Upper plates ... ... 4 — 4
King-posts and queen-posts ... ... 5 — 4
Collar-plates above the door-ways ... ... 4 — 4
Door-posts and angle-posts ... ... 3½ — 4
Braces framed at bottom into the plates and at top into the posts ... ... 3½ — 3½
2 tiers of inter-ties to each story ... — ... 3 — 1½

tings.

2819. To skirt the best three rooms on the ground-story with skirting 18 ins. high consisting of double plinth 14 ins. high and mouldings 7 ins. girth, with all proper grounds and backings thereto.

2820. To skirt the best three chambers, the entrance-hall, the principal stair-case, and the passages, and lobbies on the ground-story and one-pair story of the main building, with double rebated plinth 3½ ins. high and base-mouldings 4½ ins. girth, with all proper grounds and backings.

2821. To skirt with inch square skirting 6 ins. high plugged to the walls, all the remainder of the rooms, passages, and other parts of the building intended to be plastered.

dows.

2822. To fit up all the windows of the ground-story and one-pair story of the main building, with 2-in. yellow deal lambs'-tongue sashes, double hung with the best large patent lines, brass axle-pulleys, patent spring fastenings, and iron weights, in deal cased-frames with English oak double sunk sills.

2823. To fit up the attic South window with 2-in. ovolo sashes formed according to the drawings, with mitred beads and external dressings; the side-lights are to be hung as casements, and are to have fastenings to each window value 5*s*.

2824. To fit up all the remainder of the windows throughout the buildings with 1½-in. ovolo sashes double-hung, with the best large patent lines, iron weights, iron axle-pulleys, and patent spring fastenings, in deal cased-frames with English oak sunk sills.

ters.

2825. To put to all the windows on the ground-story of the main building, to the windows in the bows on the one-pair story of the main building, and to the two entrances of the main building, 1¼-in. bead-flush and moulded shutters two panels high to correspond with the doors, hung in two heights, with strong spring shutter-bars; and with 1½-in. proper boxings finished with mould-

ings to correspond with those of the architraves round the doors; inch deal bead-flush back-linings two panels high; 1¼-in. moulded backs, elbows, and soffits to correspond with the shutters; beaded capping, and elbow-caps; side-linings returned outside the boxings, and all other requisite fittings complete.

2826. To fit up all the remainder of the windows on the ground-story with 1¼-in. clamped shutters with rule-joints, hung complete with inch linings finished with mouldings like those round the doors, and wainscot dove-tailed bars with cast-iron sockets.

2¼-in. doors. 2827. To put to the principal two external door-ways, 2¼-in. lambs'-tongue sashed doors, moulded on both sides, with inch deal panels, and hung each with three 4-in. butt-hinges and with other ironmongery to each value 20*s*.

2-in. doors. 2828. To put to all the other external door-ways of the building 2-in. four-panel bead-flush and square doors hung each with a pair of 4-in. butt-hinges and other ironmongery value 15*s*.

2829. To put to all the remainder of the door-ways on the ground-story and one-pair story of the main building 2-in. deal four-panel doors with ¾-in. deal panels moulded according to the drawings, and hung each with a pair of 4-in. butt-hinges and other ironmongery value 15*s*.

1¼ in. doors 2830. To put to all the door-ways of the basement-story 1½-in. four-panel doors bead-butt on both sides, hung each with a pair of 4-in. butt-hinges and fastenings to each value 7*s*.

2831. To fit up all the remainder of the door-ways of every kind throughout the entire building with 1¼-in. four-panel square framed doors with ¾-in. deal panels and hung each with a pair of 3½-in. butt-hinges and other ironmongery value 10*s*.

Door-linings 2832. To fit up all the door-ways of the building with 1¼-in. framed tongued and rebated linings, those thereof more than 10 ins. wide framed and finished to correspond with the respective doors hung therein.

Door cases. 2833. To put to the basement-doorways oak proper door-cases 5 ins. by 4 ins., and to put to all the external doorways throughout the building fir proper door-cases 5 ins. by 4 ins. with oak sills 4 ins. by 3½ ins. (*The oak sills may with propriety be omitted, and the door-posts may be inserted in stone steps.* See § 1407.)

Architraves, &c. 2834. To put on both sides of all the doors above the basement-story throughout all the buildings, inch yellow deal grooved grounds 4½ ins. wide; to put all round all the doors on the ground-story and one-pair story of the main building, moulded architraves 6 ins. wide according to the drawings; and to put all round on both sides of all the other doors throughout the whole building mouldings 4 ins. girth laid upon the grounds.

Principal stair-case. 2835. To construct the principal stair-case according to the

drawings, with 1½-in. best clean yellow deal feather-tongued risers, treads, and landings, on very strong bracketed carriages, and with moulded returned nosing; 1¼-in. string-boards; 1½-in. beaded, sunk, and mitred outer-string with brackets of carved deal (*or of cast-iron, as the case may be;*) 1¼-in. apron linings; best Spanish mahogany large moulded circular and ramped hand-rail with large scroll to the curtail step; and dove-tailed bar balusters one inch square, every 10th baluster being of wrought-iron.

ck staircase.

2836. To construct the back stair-case according to the drawings with 1½-in. yellow deal steps, risers, and landings, feather-tongued and housed into 2-in. yellow deal string-boards, moulded planceer; turned and framed newels 3½ ins. by 3½ ins.; deal (*or real wainscot, as the case may be,*) moulded hand-rail with mitred caps; and dove-tailed bar-balusters 1⅛ in. square.

ucts.

2837. To fit up the closets shown by the drawings with 1¼-in. four-panel doors finished and fitted up to correspond in all respects with the doorways of the respective rooms and other parts of the building in which they are placed. To fit up the closets on the inside thereof with one hundred feet superficial of inch shelfing fixed with the requisite bearers.

ater-closets, terns, privies,

2838. To fit up the two water-closets with inch fine Spanish mahogany framed and moulded risers and clamped and moulded flaps and frames, inch pencil-cedar seats, ½ in. Spanish mahogany skirting over the seats, all requisite strong bearers, 1½-in. yellow deal pipe-casings with strong rebated and beaded grounds hinges buttons and other fastenings complete; to attend upon the plumbers while fixing the pipes and apparatus; to cut all requisite holes and find and perform all other needful work and labour for making the water-closets complete.

2839. To fit up the wash-hand basin in the water-closet with a Spanish mahogany inclosure value 30*s.*

2840. To put in the water-closets and where else may be directed, three dove-tailed cistern-cases of 2 in. deal each to contain 30 cubic feet of water, fixed with strong bearers, and with a ledged cover to each cistern of ¾ in. yellow deal tongued and beaded.

2841. To fit up each of the privies with inch clean deal seat riser and clamped flap and frame, with all requisite bearers skirtings and other fittings complete.

ttings in the tler's pantry, *l.*

2842. To fit up the butler's pantry with dresser sink and other fittings value 10*l.* (*A more minute description of these fittings may be inserted: but employers will rarely give minute directions for such fittings sufficient for insertion in a first contract.*)

itchen dresser, guineas.

2843. To put in the kitchen a dresser with drawers shelves pot-board and fittings complete value 8 guineas.

ttings in the rder.

2844. To fit up the larder with 1½-in. clean deal dresser-top 2 ft. 6 ins. wide, feather-tongued, and fixed on strong framed legs and rails; two meat rails each 6 ft. long of wrought fir 3½-ins. by

2 ins., suspended by wrought-iron stirrups; and a hanging shelf of 1¼-in. clean deal 10 ins. wide 6 ft. long and suspended also by wrought-iron stirrups.

Sink on the one-pair story.

2845. To put on the one-pair story a dove-tailed sink of 1¼-in. deal, and to inclose the same with 1¼-in. deal square framed front and door, the door hung with 3½-in. butt-hinges and with other ironmongery value 7*s*.

Fittings in office court.

2846. To put in the buildings of the office-court a knife-board value 10*s*., and an inclosure and other fittings to the coal-house and wood-house value together 3*l*.

20*l*. other fittings.

2847. To provide and fix such other fittings of the value of 20*l*. as shall be by the architect directed.

Jobbing-work.

(See § 2719.)

100 feet cube fir extra.

(See § 2720.)

SMITH.

Chimney-bars.

2848. To provide for each of the fire-places a wrought-iron chimney-bar 3 ins. by ½ in. properly corked at the ends thereof.

Air-grates.

2849. To provide 20 cast-iron air-gratings 9 ins. square to be fixed round the lower part of the walls.

10 cwt. ties, &c. (See § 1277.)

2850. To provide 10 cwt. of iron in such ties bolts nuts screws straps stirrup-irons and other light wrought and hammered work as may be by the architect directed.

PLASTERER.

L. P. F. S. ceilings, &c.

2851. To lath plaster float and set ceilings to the whole of the ground-story and one-pair story of the main building, including the soffit of the principal stair-case.

Troweled stucco.

2852. To execute all the sides of the dining-room, principal stair-case, entrance-hall, and the lobbies therewith connected, of the main building, with the best floated troweled stucco.

Groined ceiling.

2853. To execute in gauged stuff the groined ceilings of the entrance-hall and of the inner lobby on the ground-story.

L. P. F. S. sides.

2854. To lath plaster float and set all the partitions and the battening of the sides of all the remainder of the main building.

R. F. S.

2855. To render float and set all the un-battened brick-work of the main building.

L. P. S. ceilings, &c.

2856. To lath plaster and set in an even and correct manner

the ceilings strings and quartered-partitions throughout all the remainder of the building.

l. 2857. To render and set in an even and correct manner all the internal brick-work of the remainder of the building.

nices, &c. 2858. To execute the following plaster cornices and enrichments :

Plain cornices to the best three rooms on the ground story 16 ins. girth, with three enrichments thereto girth together 9 ins.

Plain cornices to the entrance-hall, principal stair-case, all the lobbies of the main building, and to all the rooms on the one-pair story of the main building 12 ins. girth.

Five enriched flowers with frames in the ceilings of the ground story each value 5*l*.

ıries. 2859. To provide and execute all the requisite lathing and counter-lathing : all the laths are to be heart of fir lath-and-half laths free from sap-wood.

2860. To execute all requisite beads, quirks, and arrises ; to stucco all the internal reveals ; to perform all requisite dubbing out ; to find all proper additional thicknesses ; and to form all needful mitres.

ting. 2861. To whiten all the ceilings cornices and enrichments throughout the buildings (or to colour the same as the case may be).

uring. 2862. To colour of a teint of stone-colour as shall be directed all the plastered walls and sides of the interior of the building where the same are not papered.

e-whiting. 2863. To stop neatly and lime-whiten twice all the internal brick-work of the basement story, and such of the other internal brick-work of the building as is not herein directed to be plastered ; to lime-whiten in like manner the timbers and soffit of the flooring above the basement story, and the timbers and soffit of the roofs over the small office-buildings round the yard or court.

PLUMBER.

cast-lead gutters, and ys, *(or 6½-lb. d-lead, as the may be.)* 2864. To lay all the flats, gutter-boards, chimney-gutters, and valleys, with the best cast-lead of equal thickness, weight full 7 lbs. to the foot superficial, turned up full 6 ins. against all brick-work and other perpendicular sides, and turned up full 10 ins. against the rafters : all the flats are to be laid with rolls not more than 2 ft. 3 ins. apart, and the lead to the valleys is to be full 20 ins. wide.

milled-lead ings. 2865. To put flashings of 5 lb. milled-lead 5 ins. wide round all the gutters and flats where requisite.

5 lb. milled-lead to hips and ridges.

2866. To cover all the hips and ridges with 5 lb. milled-lead 18 ins. wide, properly secured.

5 lb. milled-lead step-flashing.

2867. To put step-flashings of 5 lb. milled-lead, average 16 ins. wide, to the ends of the roofs where the same gable or rake against the brick-work. (See Index for fillets of brick-work and masonry.)

Copper eaves'-guttering.

2868. To put all round the projecting eaves of the main building neat 5½-in. semicircular guttering of copper, weight 20 oz. to the foot superficial, fixed on sufficient wrought-iron brackets.

Iron eaves'-guttering.

2869. To put to all the remainder of the eaves of the building 4-in. cast-iron guttering, jointed with white-lead, and fixed upon strong wrought-iron brackets.

Cast iron R. W. P.

2870. To provide and fix the following stacks of cast-iron rain-water pipes continued from the roofs quite down into the drains, and with heads and shoes complete.

Five stacks from the principal roof 3½ ins. bore.

Four stacks from the other roofs 3 ins. bore.

3 water-closets. (See Index.)

2871. To fit up the two water-closets with the very best Bramah's patent valve apparatus, with blue basins, D traps, 5-in. soil-pipes of 10 lb. lead, soil-box, ¾-in. service-pipe, air-pipe, warning-pipe, and all other requisite fittings, work, and appertenances of the most complete description.

3 cisterns.

2872. To line with lead the three cisterns, the bottoms thereof with cast-lead, 10 lbs. to the foot superficial, and the sides thereof with milled-lead 5 lbs. to the foot superficial: to lay on the water to the several cisterns with sufficient inch strong lead service-pipe, with cocks, and other proper fittings complete; and to put to each cistern a strong lead 1¼-in. waste-pipe.

Sinks, &c.

2873. To put in the lower water-closet a blue wash-hand basin with washer, plug, and 1½-in. strong waste-pipe; and to lay on the water thereto with ¾-in. strong lead pipe, cock, and the other proper fittings and appertenances complete; to line the sink on the one-pair story and the sink in the butler's pantry with lead the same as described to the cisterns; and lay on the water thereto, as described to the lower water-closet; to put thereto and to the scullery-sink 2-in. strong waste-pipes with brass bell grates.

Pump, 1½-in. pipe, &c.

2874. To provide and fix a 3-in. lifting engine pump with brass barrel worth not less than £10, and put from the well one hundred feet run of 1½-in. very strong suction pipe with joints complete.

3 cwt. extra lead-work.

2875. To provide under the contract 3 cwt. extra of cast lead-work including labour and all proper materials, to be used in such additional works as the architect may direct; deduction however is to be made for the same if not used after the rate per cwt. including the labour and all materials in fixing the same; and to provide and fix all additional extra lead-work

the kind above-described at the like price of per cwt. including the labour and the requisite other materials.

PAINTER.

ration. 2876. To knot with silver leaf, stop, pumice smooth in every part, and prepare properly in the most perfect manner, all the wood-work and the other works intended to be painted.

s in oil. 2877. To paint four times with the best oil-colour all the internal and external wood-works and iron-works, all the stucco, and all the other works where all the said works are usually painted.

tion of i marble to incipal case. 2878. To paint the walls of the principal stair-case and of the entrance-hall and of the lobbies adjoining thereto, in the most artistlike manner in imitation of sienna marble, lined out with masonry-jointing, and varnished twice with the best copal.

doors. 2879. To finely comb and grain in imitation of wainscot in the most artistlike manner, and varnish twice with the best copal, both sides of all the doors on the ground-story of the main building.

ng. 2880. To flat extra of such teints of stone-colour as may be directed, the whole of the remainder of the stucco-work, and all the remainder of the wood-work of the ground-story and of the one-pair story of the main building: the joiner's work of the best three rooms on the ground-story is to be finished in three teints.

al colours. 2881. The sashes are to be finished on the ontside thereof with dark purple-brown; the other plain painting is to be in general finished of such teints of stone-colour, drab, or brown, as may be by the architect directed.

GLAZIER.

glass. 2882. To glaze all the windows and lights of the ground-story and one-pair story of the main building with the best Newcastle crown glass.

lass. 2883. To glaze all the remainder of the windows and lights throughout the building with good clear second Newcastle crown glass.

ing, &c. 2884. The whole of the glazing is to be properly bedded, bradded, and back-puttied, and is to be cleaned and left perfect immediately before the final rendering up of the whole of the works as complete.

PAPER-HANGER.

Preparation.

2885. To prepare properly all the walls intended to be papered, and to bring the same out to a proper face.

Drawing-room and study paper 14d., border 6d. underlined.

2886. To underline with strong cartridge-paper and hang with figured paper, value 12d. per yard, with border at top and bottom value 6d. per yard, the whole of the drawing-room and the study.

2 water-closets, best 3 chambers, and dressing-rooms, &c. paper 8d. border 2d.

2887. To underline with strong cartridge-paper and hang with figured paper, value 8d. per yard, and border value 2d. per yard, the two water-closets and the whole of the best three chambers, and the lobbies dressing-rooms and closets thereto attached.

Back stair-case, other chambers, &c. &c. paper 4d.

2888. To hang with figured paper, value 4d. per yard, cut close, the whole of the back stair-case and the whole of the remainder of the chambers on the one-pair story, and all the closets lobbies and passages thereto attached.

CHAPTER XXV.

A SPECIFICATION *of the several artificers' works to be done in erecting and completely finishing a new small* CHURCH *or* CHAPEL *upon a certain plot of ground at , in the parish of , according to the drawings hereunder enumerated, and according to such directions and further drawings as may by the architect be given.*

Schedule of Working-drawings referred to in this Specification. (See § 986.)

No. 1. Plan of the site of the building.
2. Plan of the foundations.
3. Plan of the ground story.
4. Plan of the naked walls.
5. Plan of the galleries.
6. Plan of the roofs.
7. Elevation of the principal Western or Entrance Front.
8. Elevation of the flanks.
9. Elevation of the East or Chancel end.
10. Section from North to South towards the Chancel.
11. Section from South to North towards the Tower.
12. Longitudinal section from West to East.
13. Construction of the galleries.
14. Trusses of the principal roof.
15, &c.

CHAPTER XXV.

BRICKLAYER.

Level foundations.

2889. To level the ground of the intended site for the building and beat down the same hard.

Rubbish.

2890. To procure and shoot about the intended foundations, sufficient hard rubbish in order to raise the ground for the extent of 10 feet upon the surface on every side beyond the intended artificial foundation hereafter described, and for the height of six feet above the lowest part of the present surface of the building-plot; to fill up in like manner with hard rubbish the internal part of the building, to the height of 6 ft. 6 ins. above the present lowest level of the ground; to pour water from time to time at every 6 ins. in depth of the rubbish in order to consolidate the same.

(This was for the erection of a building in a low situation, where it was intended that the ground should be raised considerably in the neighbourhood of the building.)

Artificial foundation. (See Index.)

2891. To make an artificial foundation for the entire building, 3 ft. in depth, and 2 ft. 3 ins. wider than the lowest course of footings of all the several walls and foundations; also under the entire surface of the tower, and under the iron columns and other parts as shown by the working foundation-plan: the artificial foundation is to be composed entirely of the following materials, viz., one seventh part by measure of the best fresh quick Dorking stone-lime beaten to fine powder, and six seventh parts by measure of stone coarse ballast and fine ballast unscreened; the ballast and the lime are to be mixed together regularly in small quantities, and when properly united and while yet hot are to be poured or shot from scaffolding so as to fall not less than 10 ft. down into the bed of the work, in layers of not more than 6 ins. deep as shall be by the architect directed, till the whole foundation round the building reaches the height or depth of 3 ft. above the bed of the ground..

Digging.

2892. To dig out the ground or rubbish wherever may be requisite for carrying into effect the building according to the design.

Clear away rubbish.

2893. To clear out of the building from time to time, all rubbish which may accrue within the same by reason of any works of any kind which may be carried on therein; and to leave the whole of the building and the plot of ground upon which the same is to stand, at the rendering up of the same finally as complete, clear and free from rubbish and useless materials of every kind.

Notice to District-surveyor, &c.

(See § 987.)

Scaffolding materials, &c.

2894. To provide, fix, maintain, alter from time to time as may be required by the various workmen, and finally remove and cart away when so directed, all manner of sufficient safe and convenient scaffolding, with all requisite poles, putlogs, ledgers,

boards, wedges, cords, ropes, pulleys, ladders, and other things requisite for the performance of all the works of every kind soever in and about the building.

Water, &c.

2895. To draw off, pump, and remove away from the building, all injurious slop, soft soil, and water, which may come in upon or about the same by rain or otherwise; and to make good all damage which may occur thereby to the brick-work foundations and other works.

General brick-work. (See §§ 990—1.)

2896. To execute all brick-work requisite for carrying into effect and for completing the building and all its appertenances according to the drawings and under the directions of the architect.

Rough arches.

2897. To turn arches and counter-arches according to the drawings and wherever else the same can be put; the arches are in all cases to be turned quite through the whole thickness of the respective walls with the exception of the outer 4 ins. of the faced work, and the spandrils and heads of the blank recesses in the walls are to be filled in afterwards to the soffits of the arches.

Vaulting of altar.

2898. To turn in brickwork the vaulting over the altar; and to fill up the spandrils in solid brick-work to the height shown by the drawings. (See §§ 508 and 2528.)

Flues, &c.

2899. To properly turn parget and core the flue of the vestry-chimney and the four other flues in the side walls of the building; and to put under the slab of the vestry fire-place a 4-in. brick fender 12 ins. high.

Bedding, &c.

2900. To bed and point all the bond-timber, wood-bricks, templets, and other things so requiring, in and about every part of the building; to bed and point with lime and hair mortar all the door-frames; and to fill in with brick-work behind all stone-work and between all joists and other timbers.

Piers, &c. under iron columns, pulpit, reading-desk, and font.

2901. To build the piers and other brick-work for the support of the iron columns, pulpit, reading-desk, and font, as shown by the drawings.

Piers under sleepers.

2902. To put under all the sleepers beneath the floors, brick piers not more than 3 ft. apart, 9 ins. square, and three courses high, and with one course of brick-work 13½ ins. square beneath the same.

[illegible] walls to [illegible]

2903. To build 4-in. brick walls 12 ins. high, to receive the lateral joints of all the paving.

[illegible]

2904. To build 9-in. brick piers 3 courses high to support the external steps; the vestry-door is to have two piers; each of the three doors is to have three piers.

2905. To brick-nog the partition between the body of the church and the vestry.

[illegible]

2906. To put to all the external openings throughout the building, arches according to the drawings, formed of white bricks

moulded in the clay and burnt to wedged shapes to suit the respective openings, and dressed neatly, in the manner practised at Chelmsford and elsewhere; all the arches are to be 9 ins. wide on the face beyond the outer reveals.

Splays and jambs.

2907. To put to all the external jambs of the building and at the quoins of the eight small octagonal turrets, white bricks moulded in the clay and burnt to the shape shown by the drawings, and dressed slightly and rubbed as occasion may require to perfect surfaces.

Moulded plinth.

2908. To put outside the building upon the plinth, a course of white bricks moulded in the clay and burnt to the shape shown by the drawings.

Moulded cornices, &c.

2909. To put all round the building beneath the battlements and also up the gables, a cornice of white bricks moulded in the clay and burnt to the shape shown by the drawings; to put a similar cornice beneath the situation intended for a clock-dial, and to put similar brick cornices to gird round all the eight octagonal turrets at the several heights shown by the drawings.

2910. To put to each of the two buttresses near the tower and to each of the ten small angle buttresses at the lower part of the tower, water-tables of white bricks as the cornice above described. (*If these be made of stone instead of brick, see Index.*)

Facings.

(See §§ 358—60 and 867.)

2 rods of brick-work extra.

(See § 1007.)

Bricks.

(See § 1008.)

Mortar.

(See § 1009.)

Grouting.

2911. The whole of the brick-work is to be grouted with liquid mortar at every alternate course thereof, particular care being taken that the facings of the work shall not be stained.

Mode of doing the work.

(See §§ 353—365 and 1010.)

Reparation of accidents, &c. (See §§ 453 and 1111.)

2912. The walls of the tower are to be built inclining inwardly according to the drawings; all the other walls are to be built level and perpendicular, and should any damage occur thereto by accident, settlement, or otherwise within 12 calendar months from the time of the building and works being delivered up as complete, the contractor is to make the same good at his own expense, as shall be by the architect directed.

Jobbing-work.

(See § 1011.)

MASON. (See §§ 265—295.)

2 courses of 3-in. paving 18 ft. square under tower.

2913. To put under the foundation of the tower two complete courses of 3-in. Yorkshire stone paving, each course thereof

18 feet square, and with the joints therein laid close and crossed upon each other as much as possible.

2 courses of 3-in. paving to walls.

2914. To lay round and under the foundations of all the walls of the building, two courses of 3-in. Yorkshire stone paving as described for the foundation of the tower, and of the widths shown by the plan of the foundations and by the other drawings.

4-in. paving 13 ins. by 18 ins. under iron columns.

2915. To put under each of the 16 cast-iron columns a piece of 4-in. Yorkshire stone 13 ins. by 18 ins.

14 water-tables to buttresses.

2916. To put to the twelve buttresses at the flanks of the building, and to the two inner buttresses at the front of the building, water-tables of Portland stone moulded according to the drawings: each water-table is to be 18 ins. long, 12 ins. broad, and 15 ins. high.

2 angle-buttresses.

2917. To put to each of the two angle-buttresses of the body of the church a lower water-table of Portland stone 18 ins. long, 12 ins. broad, and 9 ins. high, and an upper water-table of Portland stone 18 ins. long in front, 18 ins. high, 2 ft. 9 ins. long in flank, moulded in front, and sunk out on the top.

Water-table coping.

2918. To cope the whole of the battlements, parapets, and gables with Portland stone water-tabling, two blocks of which may be cut diagonally out of stone 12 ins. by 9 ins., the whole throated and moulded according to the drawings: the copings to the battlements and to the embrasures between the same are to be each in one stone; all the other copings are to be in length as long as possible, and are to be plugged with lead. Note, that the battlements to the tower will require the water-tables, to be sunk out of the solid stone, at the angles of the embrasures, where the perpendicular water-tablings mitre therewith.

Key-stones (if any).

2919. To put to all the windows and external door-ways key-stones of Portland stone, of the sizes shown by the drawings, and of the thickness of the whole of the external reveals, and moulded to the forms of the arches.

3 chimney-caps.

2920. To put to each of the three pointed gables, a chimney-cap of Portland stone, to suit the form of the water-tables and gables, but 8 ins. wider than the water-table, in order to cover over the top of the flue, and of height and width sufficient for the width of the flue, and the rake of the gable; each chimney-cap is to be cut through for the chimney-flue to pass out of the same.

10 water-tables to small tower buttresses.

2921. To put to the ten small angle buttresses, at the lower part of the tower, upper water-tables of Portland stone, each 9 ins. long, 12 ins. deep, and 6 ins. high.

10 gable-heads to ditto.

2922. To put to each of the ten small angle-buttresses, at the lower part of the tower, a Portland stone gable trois-feuille-head wrought according to the drawings, 15 ins. high, 15 ins. wide, and 12 ins. deep.

Water-table sills to the 16 principal windows of the body.

2923. To put to each of the 16 principal windows of the body and stair-cases of the church, a throated water-table-sill

Portland stone, 5 ft. 4 ins. long, 18 ins. high, and in three beds each 6 ins. high and 7½ ins. wide: Note, that two beds may be cut out of stone 10½ ins. wide, thus:

The upper bed of each sill is to be in one stone.

indows. 2924. To put to each of the three altar-windows, a water-table-sill, of description similar to those last described; but consisting of only two beds of stone.

windows. 2925. To put to each of the five principal windows of the tower Portland stone throated sills as to the altar, but with each of the two beds 9½ ins. wide, instead of 7½ ins.

vindows, window, ot win- isle-win- altar. 2926. To put to each of the three small gable-windows, to the small belfry-window, to the three transept-windows, and to the two aisle-windows by the altar, a Portland stone throated water-table sill 8 ins. by 6 ins.

vs over -case 2927. To put to each of the two windows over the stair-case doors, a Portland stone water-table-sill, wrought out of the solid, 2 ft. high and 8 ins. bed.

-mullions &c. (See Index.)

l steps. 2928. To put to each of the four external doors, three rubbed Yorkshire stone steps *(or steps of Craig-leith stone, as the case may be)* scantling, 12 ins. by 6 ins., back-jointed, and cut out to receive the ends of the door-cases.

· heads . 2929. To put to the angle-turrets of the bell-tower, four Portland stone canopy heads, or ogive domes, each in three pieces, wrought according to the drawings, the lower bed thereof to be 3 ft. 6 in. by 3 ft. 6 in. and 1 ft. 3 in. high, the middle bed thereof to be 3 ft. by 3 ft., and 1 ft. 9 in. high, and the upper bed thereof to be 1 ft. 9 in. by 1 ft. 9 ins., and 1 ft. 9 ins. high.

ıp kes, 2930. To put at the top of each ogive dome a copper spike, 2 ft. 6 ins. long, inserted 15 ins. deep and run with lead into the stone-work.

Each bed of the canopy heads, or ogive domes, is to be secured from sliding by two strong copper plugs, let into the horizontal joints thereof.

to small 2931. To put to the small octagonal turrets at the angles of the transepts, four heads of Portland stone, wrought according to the drawings, each consisting of a lower bed 2 ft. by 2 ft., and 1 ft. 6 in. high, and an upper bed 1 ft. 6 ins. by 1 ft. 6 in., and 1 ft. 6 in. high, the upper and the lower stones of the turret-heads are to be secured by two strong copper plugs, at each horizontal joint thereof.

one in 2932. To put all round the tower beneath the bell-chamber windows, two courses of 3-in. Yorkshire stone paving, close jointed, and wrought and throated in front according to the sketch, the upper course thereof 1 ft. 9½ ins. wide, the lower course thereof 1 ft. 7 ins. wide: and to let into the Yorkshire-stone the eight collars of the chain-bar.

2933. [This is given rather as an example for reprehension of the use of Yorkshire stone for such a purpose: what effect frost has in separating the layers of such stone may be seen in the moulded edges of the floorings, of the stone verandah in front of the late Sir John Soane's house in Lincoln's Inn Fields, which fashioned as ornamental string-courses, are shivered to pieces.]

Bond-stones to ringing-loft doors.

2934. To put in the brick-work of the tower four pieces of 3-in Yorkshire stone paving, each 1 ft. 2 in. by 1 ft. 10½ ins., and each with a strong hinge-hook to receive the doors leading to the roof, and rebated out and worked with fair edges.

Rubbed Yorkshire stone paving

2935. To pave with rubbed 2½-in. Yorkshire stone paving, in regular courses, the porch and the two stair-cases of the church, and the whole of the inside of the church, except the altar, the baptistry, and the vestry thereof.

Vestry chimney-piece, &c.

2936. To put to the vestry fire-places 1½-in. Portland stone jambs and shelf, 6 ins. wide, chamfered on the edges, and 1½-in. Portland stone mantle, 7½ ins. wide, chamfered on the edges, and cut out 2 ins. to the form of a flat Gothic arch; to put to the vestry fire-place also a 2-in. Portland stone chimney-slab 2 ft. by 4 ft., and a rubbed Yorkshire stone hearth, 2 ft. 6 ins. by 1 ft. 1½ in.

Font.

2937. To provide and fix in the baptistry, a font of Portland stone, in only three pieces wrought *(and carved as the case may be)* according to the drawings.

Quality of the stone, &c.

2938. The whole of the stone is to be hard, and of the very best quality free from shakes, vents, and all other defects; the whole of the stone is to be laid so as for pressure to consolidate the stone in the natural way of its bed, and is to be from the most approved quarries.

Rectify damage, cut out, &c.

2939. To rectify all damage of every kind which may arise from any cause whatsoever to any portion of the stone-work: to cut out for all mortises, tenons, iron-work, and wherever else may be requisite.

Work to be cleaned off at the completion of the contract.

2940. The whole of the mason's work is to be cleaned off immediately prior to the completion of the other works of the contract.

10 ft. Portland stone additional.

2941. To provide 10 ft. cube of Portland stone, properly wrought with plain work in addition to the stone required for the completion of the building according to the drawings, and to fix the same where the architect may direct; but the value of all such of the said 10 ft. cube of stone, as shall not be so directed to be used, is to be deducted from the sum, which would otherwise become due to the contractor after the rate of per cubic foot.

SLATER. (See §§ 542—3.)

Queen slates 18 ins. wide 33 ins. average length, copper nails.

2941. To slate the whole of the roofs over the body, transepts, and stair-cases of the church with the best new strong

queen slates, nailed with strong copper nails: the slates are to be 18 ins. wide and in length commencing 36 ins. long at the gutters and diminishing gradually towards the ridges to 30 ins. long: the whole of the slating is to be laid with proper similar bond and jointing as well at the ridges as elsewhere, and is to be lapped 3½ ins. at the very least.

Pointing.

2942. To point the inside of all the slating with stone-lime mortar with sufficient hair therein.

Reparation.

2943. To repair to the satisfaction of the architect all damage which may occur during the progress of the works to the slating, and to leave the same perfect at the opening of the church.

CARPENTER AND JOINER. (See §§ 337—40.)

Hoard.

2944. To put up, maintain, and clear away when so directed sufficient substantial hoarding 6 ft. high to inclose the whole of the site of the intended church and of the works thereof.

Office for clerk-of-the-works.

(See § 2574.)

New materials.

(See § 1029—30.)

Timber and deals.

(See § 1031.)

Sundries.

(See § 1032—3.)

Bond timber. (See § 1038.)

2945. To put all round the walls of the body of the church and baptistry three complete tiers of fir bond-timber 4 ins. by 2½ ins. to receive the wall-linings of the ground-story.

To put all round the walls of the church and transepts above the gallery-floor thereof three complete tiers of similar bond-timber, the upper tier where the same crosses the windows is to be left in and is to be wrought and rounded to form a hand-rail.

To put round the vestry-room two complete tiers of similar fir bond-timber.

Chain-plate.

2946. To put a complete chain-plate 6 ins. by 4 ins. round the entire body of the church and round the transepts and the stair-cases thereof at the height of the gallery-floor, the chain-plate is to be wrought at all the parts thereof which cross the windows.

2947. *No chain-plate should ever be built within the body of a wall, more especially if near the ground; many buildings have been ruined by the rotting of chain-plates.*

Other bond.

2948. To put bond-timber 4 ins. by 2½-ins. wherever requisite for fixing the stair-cases.

All the bond-timber is to be lapped 6 ins. at least at all the joins therein, and is to be properly halved spiked and dove-tailed: the bond timber is to be in the greatest possible lengths and no short pieces of bond are to be admitted in any part of the work, except to narrow breaks in the brick-work.

Wood-bricks.

2949. To put to each of the 30 principal openings of the building 16 wood-bricks 4 ins. by 2½ ins. and 9 ins. long; to put to each of the other openings 8 similar wood-bricks; and to put in the various parts of the work the other requisite wood-bricks.

Lintels. (See § 1041.)

2950. To put to each of the five inner door-ways leading to the body of the church two fir lintels 6 ins. by 4 ins. and 18 ins. longer than the opening.

Door-cases.

2951. To put to each of the four entrance door-ways, a fir proper door-case 5½ ins. by 4½ ins.; each of the three front door-ways is to have a transom 6 ins. by 2½ ins.

Case up stone-work.

2952. To case up all the stone-work during the progress of the other works to preserve the same effectually from injury.

Centering.

2953. To provide, fix, ease when so directed by the architect, and finally remove, centering sufficient for turning all the arches and vaulting.

Moulds, &c.

2954. To provide all moulds, rods, gauges, laths, and other things requisite in order to set out form and adjust properly the various works.

Fix iron-work.

2955. To cut out for and fix and adjust all the ties straps and other smith's work connected with the wood-work.

Roof over the body of the church and over the stair-cases.

	Ins.	Ins.
2956. Wall-plate	8	by 6
4 diagonal ties upon the wall-plate each 6 ft. long ...	8	— 4
12 oak corbeilles each 5 ft. long	6	— 9
6 tie-beams cambered 3 ins.	12	— 6
12 principals at bottom 9 ins. by 6 ins. at top	8	— 6
6 king-posts	9	— 6
do. in the waist...	5	— 6
12 queen-posts	8	— 6
do. in the waist...	3½	— 6
24 struts...	6	— 4
12 do.	4	— 3½
6 purlins each in one piece the entire length of the building	9	— 6
36 blocks under do. each 1 ft. 6 ins. long	6	— 5
3 tiers of plates across the gables to receive the ends of the purlins	6	— 4
12 diagonal ties from the purlins to the plates each 3 ft. long	6	— 3
12 blocks under the feet of ditto each 1 ft. 6 ins. long	4	— 4
Pole-plate	4	— 6
Ridge rounded for lead	8	— 1½
Common rafters	4	— 2
Crown-plates to stair-cases	4	— 4
Inch lear-board 8 ins. wide, inch slate-battens 2¾ ins. wide.		
Wrought chamfered and grooved binding-joists ...	7	— 5
Ceiling-joists	3	— 2
Cradling to the six large ribs upon the ceiling beneath		

		Ins.	Ins.
	the trusses, of inch deal, with the circular ends thereof in two thicknesses.		
Roofs over transepts.	2957. Wall-plates	6	by 4
	4 Angle-ties on ditto	6	— 4
	4 Purlins chamfered wrought and grooved	9	— 6
	4 struts under ditto	6	— 4
	Rafters	5	— 2
	Ridge	9	— 1½
	Lear-boards and battens as to the principal roof.		
Gutters.	2958. 1¼-in. yellow deal gutters with strong bearers clear of sap-wood 1½-in. current to 10 ft. 2½-in. drips rebated for the lead, cess-pools to the rain-water heads, &c.: the gutters of the transepts and altar are to be 10 ins. wide in the narrowest parts thereof.		
Flat over the tower.	2959. Wall-plate	4	— 4
	Joists	6	— 2
	Trimmers...	6	— 3
	1-in. yellow deal boarding listed free from sap-wood.		
	2960. A dormer with plates and door-case 4 ins. by 4 ins., quarters and joists 4 ins. by 2 ins., and covered on the outside with yellow deal listed free from sap-wood; and with a ledged wrought ploughed and tongued dormer-door hung complete with a bolt and a pair of strong hinges.		
Floor, &c. of the bell-chamber.	2961. Wall-plate	6	— 6
	Two girders	9	— 9
	Joists	6	— 3
	1½-in. ploughed and tongued yellow deal floor listed free from sap-wood with a ledged trap-door hung therein with a pair of 18-in. cross-garnet-hinges and a flush ring.		
	To provide and leave in the belfry, a light ladder to reach up to the leaded flat over the tower.		
Floor, &c. of the ringing loft and children's staircase, &c.	2962. Wall-plates	4	— 4
	Joists	6	— 2
	Trimmers..	6	— 3
	1½-in. rebated and filleted yellow deal boarded floors listed free from sap-wood, with a ledged trap-door in the floor hung with 18-in. cross-garnet hinges and a flush ring.		
	The well over the lobby under the tower is to have also an 1¼-in. under trap-door framed in nine panels with inch beaded linings round the well-hole.		
	To provide and leave in the ringing-loft, a light ladder to reach up to the bell-chamber.		
Floors of the galleries.	2963. Wrought and chamfered binding-joists grooved for the edges of the ceilings ..	12	— 4
	Cross joists	4½	— 2
	Oak templets under cast-iron trusses, 3 ft. 6 ins. long..	9	— 6
	(These may be of granite curb 12 ins. by 8 ins.)		

		Ins.	Ins.
	1¼ in. yellow deal floors of half boards listed free from sap-wood.		
	¾ in. deal casing in the windows behind the floor and under and in front of the chain-plate wrought, tongued, and beaded.		
	Joists to organ-loft	10	— 3½
	Binders under free seats	10	— 4½
	Bearers above ditto	6	— 3
	Blocks to support bearers	5	— 3
Long truss from wall to wall upon 4 columns to support organ-loft, free-seats, &c.	2964. Tie-beam and upper-plate each 45 ft. 6 ins. long in one length	8	— 4
	4 Queen-posts	8	— 4
	4 Braces	4	— 4
	2 ditto	7	— 4
	Wrought-iron king-bolt 1 in. diameter, with nut and washer.		
	Quarters between truss	3	— 2
	Ceiling-joists to large end-gallery	4	— 2
4 trusses under binders of large end-gallery resting upon 8 columns.	2965. Ties	7	— 4
	Principals	6	— 4
	Struts	4	— 4
	Wrought-iron king-bolts ¾ diameter, with nuts and washers.		
Floors of transept galleries.	2966. Binding-joists	12	by 4½
	Templets to ditto 3 feet long	6	— 6
	Cross-joists and trimmers	4½	— 2
	Plates for ditto	4	— 2½
	1¼-in. yellow deal floors of half boards listed free from sap-wood.		
	Ceiling-joists to the vestry	3	— 2
	The binding-joists over the baptistry are to be wrought and chamfered and grooved for the plastering.		
Floors of children's galleries.	2967. 2 framed trusses with		
	Ties	8	— 4
	Principals...	6	— 4
	Struts	4½	— 4
	Wrought-iron king-bolts 1¼-in. diameter with nuts and washers.		
	Binding-joists wrought on one side	8	— 3¾
	Cross-joists wrought in front	3½	— 2
	1¼-in. yellow deal floor of half-boards free from sap-wood.		
	Ceiling-joists over the principal stairs	4	— 2
Gallery-fronts.	2968. Wrought and chamfered breast-summers grooved for the plastering	15	— 4
	Principals...	5	— 4
	Kings	8	— 4
	Upper plate	4	— 3
	Quarters	4	— 2
	2 tiers of inter-ties	4	— 1½

[redacted]

[APTER XXV.

		Ins.	Ins.
	¾ in. wrought rebated and beaded linings inside the gallery-fronts.		
	¾ in. plain wrought linings outside the gallery-fronts, with ¾ in. deal chamfered fillets 1½-in. wide over all the joints thereof.		
	Deal mouldings according to the drawings ¾ in. book-boards on the top of the gallery-fronts.		
	2 half-columns of deal next the altar to correspond with the iron columns.		
ısses formed ı the ends of rn breast-sum- to support the ers of the galleries next end galleries.	2969. Principals	7	4
	Struts	4	4
	Wrought-iron king-bolts 1 in. diameter with nuts and washers.		
	Quarters filled in between the trussed-work	3	2
and-floors.	2970. Oak sleepers...	4	3
	Fir joists	4	2½
	1¼-in. yellow deal floors of half boards listed free from sap-wood.		
	Rounded nosings and inch yellow deal risers 3 ins. wide next the pew-inclosures and to the altar.		
ition next ry.	2971. Sill	4	3
	Plate above door...	4	4
	Braces above door	4	3
	King-post above door	4	6
	Upper plate	4½	12
	(*Note.* This is one of the binders of the transept gallery.)		
	Door and end-posts	4	4
	Lower brace	4	4
	Quarters 13½-ins. apart	4	2
	Two tiers of inter-ties	4	1½

l-linings. 2972. To line the whole of the walls and sides of the body of the church and of the altar baptistry and galleries thereof, with ¼ in. deal half-boards listed free from sap-wood, with ¾ in. chamfered fillets 1½-in. wide over all the joints thereof, and capped on the top with inch chamfered and ploughed deal 1⅛ ins. wide.

ıster in win- s. 2973. To put in all the windows of the galleries deal balusters 1¼-in. square, set angle-wise not more than 4 ins. apart, and framed at top and bottom into the plate and rail; to put in the windows by the stairs to the children's seats similar balusters with neat strong hand-rails over the same.

s and seats. 2974. To frame and erect all the pews in every part of the church according to the drawings, with 1¼-in. square framed partitions two panels high, 1½-in. framed doors and inclosures one panel high, with styles muntins and top-rails 3 ins. wide and bottom-rails 6 ins. wide; the panels of the doors and inclosures are to be in no instance more than one board in width, and the frame-work round them is to be chamfered; to hang all the pew-doors each with a pair of wrought-iron 3 in. butt-hinges and an iron button;

to cap the whole of the pewing with grooved and moulded (or wainscot as the case may be) capping according to the drawings.

2975. To fit up all the pews with 1½-in. wrought and rounded seats 12 ins. wide with proper bearers, and 1¼-in. cut brackets not more than 3 ft. apart and with rounded ends next the pew doors; to hang all the flap-seats in the galleries with strong joints, and to put to all the pews ¾ in. book-boards 6 ins. wide with ½ in. rounded capping, proper bearers and ½ in. cut brackets under the same not more than 2 ft. 6 ins. apart, and with the ends thereof rounded next the pew-doors. The inclosure of the organ-loft and of the free-seats adjoining thereto are to correspond with the pew-inclosures.

Free seats.

2976. To frame entirely of 1¼-in. deal, adapt and place in their proper situations, all the various free seats throughout the church as shown by the drawings; the seats are to be 11 ins. wide rounded in front, the backs of them are to be framed with styles muntins and rails 3½-ins. wide, and the standards ends and supports of them all are to be shaped according to the drawings: the ends of the free seats in the south-west gallery are to be inclosed with framing and capping as to the outsides of the pews.

Children's seats.

2977. To fit up the children's galleries with 1¼-in. deal seats with 1¼-in. deal brackets not more than 2 ft. 6 ins. apart, the back seat of each gallery is to be 9 ins. wide, all the other seats are to be 7 ins. wide, and the flap-seats are to be hung with strong iron joints.

Outer doors.

2978. To put to all the external entrance door-ways of the Church 2½-in. framed doors according to the drawings, with styles and upper rails 6 ins. wide, and bottom rails and middle rails 10 ins. wide, and filled in with inch battens beaded at the back and with all the joints thereof covered over in front with ¾ in. deal fillets 1¼-in. wide chamfered (*or moulded as the case may be*) at both edges, a fillet of half the width chamfered (*or moulded*) at one edge is to be laid round all the framed parts of the doors to mitre with the other fillets; the doors are to be braced at the back with strong braces; the arched parts of the doors are to be fixed. To hang the doors with hinges and fastenings of the aggregate value of 6*l*.

Inner doors.

2979. To put to the vestry and to the five entrances into the body of the church 1½-in. six-panel flush doors prepared to receive cloth covering and hung complete in 1½-in. rounded grooved and rebated linings with 4 in. butt-hinges. The doors leading to the middle-aisle of the church are to be hung folding.

6 doors to tower.

2980. To put 1½-in. four-panel bead-flush doors, with 1¼-in. plain rebated linings, to the six door-ways leading on each side from the tower to the principal stairs, to the children's galleries, and to the roof; those of them leading to the roof are to be hung with strong hook-and-eye hinges and with bolts; the other doors are to be hung each with a pair of 3½-in. butt-hinges and a good strong 7-in. iron rimmed brass knob lock.

Windows.

2981. To lay all round withinside all the leaded lights, deal

beaded stops scribed and fixed complete. *(If the windows have stone-jambs, wood-stops will be unnecessary.)*

-windows. 2982. To fit up the four belfry-windows with oak proper frames 4 ins. by 4 ins. filled in with inch oak louvre-boards 9 ins. wide according to the drawings.

n's stair- 2983. To construct the children's stair-cases, with 1½-in. rough deal treads and landings, and inch rough deal risers, housed into 1½-in. string-boards; deal rounded hand-rails, framed and strong chamfered newels, and framed diagonal-braces to serve as balusters.

al stairs *of stone).* 2984. To construct the two principal stair-cases according to the drawings, with 1¼-in. clean yellow deal best treads, landings, and risers, moulded returned nosings, 1¼-in. sunk beaded and cut string-boards and apron linings, 1¼-in. wall-string, fir bracketed carriages 5 ins. by 3½ ins., trimmers 6 ins. by 3 ins., dove-tailed bar balusters 1¼-in. square (one tenth of the whole number thereof being of wrought-iron) wainscot moulded hand-rail 3 ins. by 4 ins. with scrolls to the curtail steps. The hand-rails and balusters are to be continued also along the wall-strings where they cross the windows.

id bap- iclosures. 2985. To divide off the altar and the baptistry with deal bar-balusters 1½-in. square placed diagonally, and wainscot moulded handrails 4 ins. by 3 ins. to put to each a framed wicket hung complete with a pair of strong brass hinges and a pulpit-latch, and with a pedestal on each side thereof according to the drawings.

a vestry. 2986. To put in the vestry beneath the window, a square-framed closet-front, and a pair of folding-doors of 1¼. in. deal, the doors hung with 3-in. butt-hinges and a 6-in. lock; and to put within the closet, two shelves of inch deal 8 ins. wide, with proper bearers, hinges, bolts and lock.

2987. To construct, fix, and make complete, the pulpit according to the drawings, with 1¼-in. framed inclosure, and 1¼-in. door hung with brass hinges and pulpit-latch, 1¼-in. yellow deal floor on bearers, inch book-board and capping, inch deal best clean deal steps and risers, moulded returned nosings, 1¼-in. beaded sunk and cut string-boards, strong bracketted carriages, inch square framed soffit under the pulpit-floor and stairs, wainscot moulded hand-rail with turned and mitred caps, square bar balusters, one tenth of the number being of wrought-iron, wrought-iron, turned newels to blocked steps, 1¼-in. deal seat 13 ins. wide inside the pulpit, with proper bearers; and all other work fittings and appertenances requisite for making the pulpit complete.

:-desk. 2988. To construct, fit up, and complete the reading-desk in all respects, the same as the pulpit.

lesk. 2989. To fit up the clerk's desk in all respect as the pews, but with an additional height of door and framing all round of 12 ins., an additional step is to be formed within-side, and the book-board is to correspond with those to the pulpit and reading-desk.

Jointy skirting.

2990. To fit up the vestry with inch chamfered skirting 10 ins. high, with ploughed grounds and backing.

Communion table.

2991. To provide and place at the altar a communion table according to the drawings.

50 ft. cube fir extra.

(See § 1071.)

SMITH.

6 stirrups to king-posts.

2992. To put to each of the six king-posts of the trusses of the roof a wrought-iron stirrup, turned up from iron 2 ins. wide ¼ in. thick, and 5 ft. 6 ins. long, and with ½-in. bolts nuts washers and keyed wedges thereto complete.

12 ditto to queen-posts.

2993. To put to each of the 12 queen-posts of the trusses of the roof a wrought-iron stirrup, turned up from iron 2 ins. wide, ¼ in. thick, and 4 ft. 9 ins. long, and with ½-in. bolts nuts washers and keyed wedges thereto complete.

Twelve 1-in. bolts to the feet of the principals.

2994. To put to each foot of the 6 pairs of principals a wrought-iron inch bolt, 2 ft. long with nut and washer complete.

Fronts of children's galleries.

2995. To put to each of the fronts of the two children's galleries wrought-iron bars ⅝ in. square, set diagonally not more than 4 ins. apart, and riveted at bottom into a wrought rail 2 in. by 1½ in., and at top into a wrought-iron rounded rail 1¼ in. by ⅝ in., which shall continue all round over the back of the brick arch at the front of the gallery, to prevent the same from spreading.

Chimney-bar.

2996. To put to the vestry fire-place a chimney-bar of wrought-iron 2 ins. by ½ in., with proper corkings thereto.

Chain-bar and collars.

2997. To put round in the brickwork of the belfry a wrought-iron chain-bar 2 ins. by ¾ in., corked down with 8 collars each 3½ ins. square, 1¼ in. thick, and run with lead. (See §§ 285—90.)

4 cwt. ties, &c. in addition. (See § 1277.)

2998. To provide and fix 4 cwt. of wrought iron (in addition to the above wrought iron-work), in such ties, straps, screw-bolts, and other light wrought and hammered-work as the architect may direct.

16 cast-iron columns 3 cwt. each.

2999. To provide and fix the 16 cast-iron columns beneath the galleries according to the drawings, each column is to weigh at least 3 cwt.

8 cast-iron trusses each 4 cwt.

3000. To provide and fix the 8 cast-iron trusses beneath the galleries, each weight at least 4 cwt.

Cast-iron saddle-bars to windows.

3001. To provide for all the windows sufficient cast-iron saddle-bars ⅝ in. by 1¼ in., and 12 ins. longer than the clear width of each window, to be laid into and worked up with the brick-work at the situations shown by the drawings.

3002. (If saddle-bars be of wrought-iron, and be inserted in masonry, all the parts of them so inserted should be tinned.)

:r-case- 3003. To put to each window a frame-work of wrought-iron for a hopper-casement according to the drawings, and to fit the same up complete with patent lines, and pulleys of brass, and the other requisite appertenances.

water- 3004. To put to the church two complete stacks of 5-in. cast-iron rain-water-pipes, two complete stacks of 4-in. cast-iron rain-water-pipes, and one stack of 2½-in. cast-iron rain-water-pipe, the whole thereof to have proper shoes and Gothic heads, and to be fixed complete.

ns. 3005. To provide all patterns requisite for the iron-work according to the drawings and directions of the architect.

g, &c. 3006. All the smith's work and iron-founder's work are to be perfect, and to be properly fitted, filed, and chipped.

3007. To provide and hang in the bell-chamber of the tower a proper church-bell, 448 lbs. in weight, with strong carriages of wood and iron, with proper mountings of bell-metal. and with ropes and all other appertenances complete.

PLASTERER.

d ceilings, 3008. To lath with lath and half heart of fir laths, and to plaster, float, set, and whiten ceilings to the whole of the body and galleries (with the quarters between the 3 wood trusses thereto) of the church, transepts, and of the vestry, stair-cases, children's galleries, porch, and the strings of the principal stairs thereof.

r's cement 12. 3009. To put round the lobby under the tower and round the lower part of the two principal stair-cases, skirtings of Parker's cement 10 ins. high, one inch thick, chamfered on the top, and jointed and coloured in imitation of stone.

stucco 3010. To execute in floated rough stucco, jointed and coloured to imitate masonry, the whole of the walls of the church and of the transepts, altar, vestry, principal stair-cases, children's galleries, and porch thereof, and also the plain groined ceiling of the altar, and the internal window-reveals throughout the building.

ings, &c. 3011. To run in stucco the moulded jambs and arches leading to the altar and to the transepts, to the blank recess behind the situation intended for an organ, and to the arches leading from the porch to the stair-cases.

3012. To execute in stucco strongly lathed and counter-lathed, the six moulded ribs in the ceiling beneath the trusses of the roof.

3013. To run and execute all requisite arrises, beads, and

quirks; to lath and counter-lath all the timbers and other works so requiring in order to form proper keys for plastering.

PLUMBER.

8lb. cast lead gutters.

3014. To lay all the gutters with cast-lead, weight 8 lbs. to the foot superficial, turned up on one side 6 ins. high against all the brick-work, and on the other side 10 ins. wide against the lear-boards.

5 lb. milled-lead flashings.

3015. To put into the brick-work round all the gutters and also over the pole-plate of the principal roof, flashings of 5 lb. milled-lead 6 ins. wide.

5 lb. milled-lead ridges.

3016. To cover the ridges of the roofs with 5 lb. milled-lead 20 ins. wide, properly secured with lead-headed nails.

5 lb. milled lead step flashings, &c.

3017. To put to all the gables and at the back of the tower, step-flashings of 5 lb. milled-lead 16 ins. average width; and to put on each side of the tower flashings of 5 lb. milled-lead 12 ins. wide to turn down over the slating.

8 lb. cast lead flat, &c. and 5 lb. milled flashings.

3018. To lay the flat over the tower and the roof over the altar with 8 lb. cast-lead turned up at least 8 ins. against the brick-work, the lead thereof joined with rolls not more than 2 ft. 3 ins. apart, and with 5 lb. milled-lead flashings 6 ins. wide.

8 lb. cast-lead valleys.

3019. To lay the four valleys with 8 lb. cast-lead 20 ins. wide.

3 in. pipe to tower.

3020. To put a strong 3-in. pipe of 8 lb. milled-lead from the flat over the tower down to the gutter of the roof of the church, with a neat gothic head and an overflow pipe to the same.

Dormer of tower.

3021. To cover the top and one side of the dormer upon the tower-flat with 5 lb. milled-lead turned up and dressed 6 ins. wide against the brick-work, and with the edges thereof covered with flashings of 5 lb. milled-lead 5 ins. wide.

PAINTER.

4 times in oil.

3022. To rub down, smooth, prepare in a satisfactory manner, knot and stop properly, and paint four times with the best oil-colour, all the iron-work of every kind, and all the wood-work of every description throughout the building, the *rough* carpenter's work and boarded floors only excepted: the first two coats of colour upon all the iron-work are to be of red-lead paint.

Colours.

3023. To finish the whole of the cappings of a dark brown colour, and to finish all the other painting of such teints of stone-colour, drab, or other plain colours, as the architect may direct.

Altar tables

3024. To write at the altar, the Creed, Lord's Prayer, and Decalogue in shaded capital letters.

Number pews. 3025. To number all the pews in shaded figures, each 2 ins. high.

Write upon free seats. 3026. To write in capital letters upon the back of each free bench the words "FREE SEATS," in shaded letters 2 ins. high.

GLAZIER.

3027. To glaze the whole of the windows and casements throughout the building, with the best second Newcastle crown glass in diagonal squares, 8 ins. long and 5 ins. wide, set in strong church window-lead, and with sufficient strong copper bands, to secure the same to the saddle-bars.

3028. To clean the whole of the windows when so directed, immediately prior to the opening of the church, and to leave all the glass then finally perfect.

CHAPTER XXVI.

SPECIFICATION *for repairing and beautifying the* PAROCHIAL CHURCH *of*

(This is an example of repair to a Church which but a few years before had undergone a very extensive substantial repair. This work was executed by contract without the occurrence of any extra charge. Substantial repairs may be extracted from others of the specifications.)

CARPENTER and JOINER.

Case up stained-glass windows. 3029. To case up with deal during the execution of the works the whole of the stained glass windows; and to remove all such casings when by the architect directed so to do.

General repairs. 3030. To carefully examine the whole of the internal and external wood-work of every kind belonging to the church, its offices, fittings, and appertenances of every kind, and wherever there shall be found any decay, unsoundness, or defect in the same, to remedy, repair, and make good all such in the most secure neat and workmanlike manner: to prepare all the carpenter's and joiner's work of every kind for the painters; to secure all loose skirtings linings and other finishings; to repair all broken panels; and generally to put such new parts to the floors and other wood-work as may be requisite in order to render complete every part of the fabric and its fittings.

To repair thoroughly and rehang with new hinges the dormer-doors, and to make good the balusters of the children's staircases.

Repair wainscot, &c.

3031. To examine carefully, and repair all the real wainscot work of every kind throughout every part of the building.

Rehang doors, &c.

3032. To take off and rehang all the pew-doors of the middle aisle of the church; to take off and rehang all the remainder of the pew-doors and other doors throughout the church in need thereof, and to ease all the doors as may be found requisite.

Brass work.

3033. To take off, clean, repair, laquer, and refix all the brass hinges, brass rails, standards, guards, hat-pins, and other brass furniture of every kind throughout the church; and to provide new brass-work of quality corresponding with the old brass-work for all deficiency on account of loss, or from any of the old brass-work being too defective to be worth reparation.

Gas-furniture.

3034. To take down, examine, repair thoroughly, laquer, refix, and make good and complete all the gas-furniture work and fittings of every kind throughout the church and the offices thereof.

Ironmongery.

3035. To examine and repair all the fastenings and other ironmongery of the whole building, to take off clean and refix all the locks of every kind, and fit the requisite new keys thereto.

Free seats.

3036. To fit up the middle aisle with real wainscot free benches as shown by the plan and other drawings, framed and constructed in all respects like the free benches in the middle aisle of , and fixed like them upon rods with pulleys, so as to remove at pleasure.

Tower

3037. To put to the ringing loft a new boarded floor of 1¼-in. yellow deal listed free from sap-wood, and rebated and filleted on the under side thereof; to repair and rehang the trap-door in the same floor; and to perform the requisite repairs and furring up to the timber-work under the new boarded floor.

PLASTERER.

Scaffolding.

3038. To erect throughout and over every part of the interior of the church, vestry, registry, stair-cases, lobbies, and vestibules, sufficient safe and complete scaffolding, with all requisite boards, ladders, cords, wedges, and other proper appertenances, so that the painters and other workmen may at one and the same time reach and perform their several works to the whole of the ceilings and walls of the building: to alter and adjust the scaffolding from time to time as the workmen for whose use the same is intended may require; and finally to carefully take down, remove, and cart away, the whole of the scaffolding and its appertenances when by the architect directed so to do.

Reinstatement of [illegible]

3039. To make good to the satisfaction of the architect all damage of every kind which may by putting up or by removing the scaffolding and the appertenances thereof occur to the church or to any of the furniture, appertenances, and works belonging thereto.

APTER XXVI.

, scrape, and r plastering.

3040. To wash and scrape every part of the ceilings, walls, decorations, and other plasterer's work of every kind throughout the entire building and its offices; and to repair, stop, and make good with oil mastic, all cracks and other defects therein, so that the painting and other work thereto may be immediately proceeded with.

ring.

3041. To colour of a teint of stone-colour the whole of the groined ceilings (with their decorations) over the north and south galleries of the church, and the ceilings and cornices of the staircases, vestry, and registry, with their decorations.

-whiting.

3042. To scrape and lime-whiten twice all the interior parts of the tower of the church before whited, and to lime-whiten twice the interior of the inclosure round the altar sky-lights.

bish.

3043. To remove from time to time all rubbish which may arise in the church from the performance of the several works, and to leave the whole building finally clear therefrom.

PLUMBER.

ir lead-work.

3044. To examine carefully all the lead-work of the roof and gutters of the whole church and of the church-tower, and to solder and repair thoroughly the same where in need thereof.

er-closets.

3045. To take up and examine the apparatus of the two water-closets, to clean and repair the same thoroughly, putting all requisite new apparatus pipes and work, and to refix and make complete the whole of the two water-closets with the apparatus pipes and appertenances thereof.

SASH-MAKER and GLAZIER.

sashes.

3046. To take out all the leaded lights from the twenty-four windows on the north and south sides of the body of the church; to clean from rust and repair thoroughly all the saddle-bars and frame-work of the windows, and to put entire new sashes of cast-iron according to the drawings, adapted so as to fit properly to the saddle-bars and frame-work, with one hopper-casement to each window, hung with patent lines and with brass pulleys, and with all other proper fittings complete.

3047. *This is an example of the substitution of iron sashes instead of leaded church-windows. This kind of substitution is now frequent, but is nevertheless exceedingly reprehensible: that leaded ecclesiastical windows, when properly made, are both beautiful and durable, is proved by the existence of so many ancient stained glass windows of this kind in our first class of cathedrals, which no person in his senses would have recst in rusting iron.*

3048. To glaze the whole of the new cast-iron sashes and

hopper-casements with the best Newcastle crown glass; the glass of the South windows of the church is to be ground.

Sky-light.

3049. To grind the glass of the outer sky-light over the altar, in order to prevent the shadows of the bars thereof from appearing upon the inner stained glass sky-light.

Other windows.

3050. To examine carefully the whole of the stained glass and other windows throughout the church, the stair-cases, the tower, the vestry, and the registry; to put to the whole of the glazing, new strong church lead-work, with new strong bands of copper, in order to secure the same to the saddle-bars; to reinstate all the broken and cracked glass by new best Newcastle glass; to put to these windows new casements of wrought-iron; to clean and repair all the iron-work of the windows, and to make the whole of the windows complete.

Clean, &c. windows.

3051. To clean and leave perfect immediately prior to the opening of the church, all the glass of every kind throughout the entire building and its offices.

PAINTER.

Five times in oil to iron work.

3052. To paint five times with the best oil-colour, all over the whole of the saddle-bars and iron frame-work of the windows, all the new cast-iron sashes on both sides thereof, and all the other external iron-work of every kind of the whole of the church and of its offices, furniture, and appertenances: the first two coats of colour upon the iron-work are to be done with red-lead paint.

Preparation.

3053. To prepare, pumice smooth in every part in the most perfect manner, burn off and remove where requisite the present paint thereon, stop and bring forward in two or more coats of colour in addition to those hereafter described and as occasion may require, every part of the painted work and of the work intended to be painted of the interior and exterior of the church, of the vestry, of the registry, of the stair-cases, of the tower, and of the vestibules of the church, and of all the fittings, works, furniture, and appertenances thereof.

Four times in oil and flatting.

3054. To paint four times with the best oil-colour and to flat twice over of a teint of stone-colour the whole of the centre arched ceiling of the body of the church, with all its enrichments and decorations; to paint and flat twice over in like manner all the walls of the church, of the stair-cases, of the vestry, of the registry, and of the lobbies of the church, and all the other plastering of the church not herein described as intended to be coloured.

3055. To paint twice with the best oil-colour, the deal pews, wainscotings, linings, and all the other internal and external works of every kind, which before were or which usually are painted: the external work of the door-cases is to be finished of the colour of Portland stone; the internal work is to be prepared as a ground for receiving graining.

.PTER XXVI.

arnish, &c. dinscot.

3056. To clean thoroughly from all the present varnish, to stain to an uniform colour where requisite, and to varnish twice with the best copal varnish, all the pews, linings, casings, mouldings, columns, pilasters, panelings, cappings, and seats, the pulpit, the reading-desk, the rails, and all the other unpainted real wainscot-work of every part of the church and of its offices, vestibules, and appertenances of every kind.

on of nt.

3057. To comb finely, paint in imitation of real wainscot in the best style and in an artistlike manner, and varnish twice with the best copal, all the painted wood-work of every kind throughout the interior and exterior of the whole church, with the vestry, registry, stair-cases, water-closets, lobbies, partitions, inclosures, pewing, linings, and appertenances thereof of every kind; and to paint and varnish in like manner all the hinges and internal iron railings.

varnish, rble imi-

3058. To clean, repair, varnish twice with copal and re-polish all the imitations of marble throughout the church.

s and aves.

3059. To paint white the capitals and architraves above the columns supporting the roof of the church.

rs.

3060. To re-paint as at present, badges and numbers both shaded, to all the pews throughout the church.

tions.

3061. To re-write with appropriate alterations, as shall be directed, the inscription in front of the Western gallery; and to re-write the words "VESTRY" and "REGISTRY" at the Eastern end of the church.

g.

3062. To clean and re-touch all the gilding about the compartment of the altar; and to repair as far as requisite the tables containing the Lord's Prayer, the Decalogue, and the Creed.

s, &c.

3063. To re-paint and gild as at present, the standards, shields, crown, and other iron heraldic emblems of the mayor's pew and other pews.

monu-

3064. To clean all the mural monuments of every kind throughout the church.

3065. *The inscriptions on the monuments may also be blacked, if it be so determined; but the cleansing of the monuments, from the difficulty of finding the owners of them, is absolutely required, otherwise many of them would remain uncleansed.*

ental table nt.

3066. To clean and re-polish to a fine gloss, the marble sacramental table and the marble font.

CHAPTER XXVII.

A SPECIFICATION *for taking down and* REBUILDING *one of the* FLANK-WALLS *of a* CHURCH.

3067. *(This work, by the careful drawing of the specification, and by a firm determination not to fall into the reprehensible deviations which so often are made in the execution of work, was executed for an amount less than the sum contracted for; but it afforded also another instance of the expense arising from improper interference, since by the refusal to wait till the work was dry, the walls shortly afterwards required to be stopped and decorated afresh.)*

BRICKLAYER.

Notice, &c to the District-surveyor, &c. (See § 987.)

Southern wall of the church. 3068. To rake out full 1¼ in. deep the mortar from all the joints in the unstuccoed parts of the southern wall of the church, both on the South side thereof down to the adjoining roofs, and on the North side thereof from the ceiling upwards; to cut out all the defective parts in the said wall, to pin in and repair thoroughly the same with sound new hard-burnt grey stock-bricks; and to point with Dorking stone-lime blue mortar the whole of the unstuccoed parts on both sides of the said wall as above stated.

3069. To repair, wash, stop, and lime-whiten twice, all the external stucco-work on the South side of the church.

Northern wall of the church. 3070. To take down and remove carefully, the whole of the Northern walling of the church from the Western front of the church Eastwards, as far back as shown by the plans, and including the break or return-wall by the turret-stairs: to take out, dig, and break up, and remove, the whole of the foundation of the said walling, taking care to damage as little as possible the vaultings of the crypt of the church; to cart away from the church all the old materials and rubbish of the present walling; to dig out the ground earth and rubbish, as may be found requisite in order to build the intended new wall; to fill in again, make up, and consolidate the same to the proper levels after the new wall is built; and to remove and cart away all the superfluous ground earth and rubbish.

3071. To cut down in the most careful manner quite perpendicularly the old brick-work and walling of the church where the new brick-work is intended to adjoin thereto next the Western front, and near the Northern windows of the church: to repair in the most careful manner and render sound and perfect with the best hard approved new grey stock-bricks set in one half by measure of new quick Parker's cement and one half by measure of clean Thames sand, the said old brick-work and walling where

the same are intended to adjoin to the new brick-work, and more particularly at the parts thereof which will be shattered by the removal of the old work.

3072. To build new walling in lieu of the present Northern walling of the church which is intended to be removed, with two courses of footings five bricks thick, two courses of footings four bricks and a half thick, two courses of footings four bricks thick, and two courses of footings three bricks and a half thick; to carry up the walling from thence to the level of the underside of the ceiling beneath the gallery, three bricks in thickness; to carry up the walling from thence to the wall-plate of the roof two bricks and a half thick; and to carry up the walling from thence to the top thereof one brick and a half in thickness, the part forming the inclosure of the turret-stairs being raised 18 ins. high above the roof over the said turret-stairs, and the remainder of the wall (forming a parapet) being raised to such a height as that the coping thereon may be level with the coping on the West front of the church. The whole of the footings of the new walling are to be full 6 ins. below the upper surface of the vault paving.

3073. To bed and point in the new brick-work the intended wall-plates, bond-timber, and the other work and things which are intended to be set therein; and to cut out for, insert, and make good to all the iron-ties intended to be put and fixed for the proper union together of the new work and of the old work.

3074. To repair and make good in a workmanlike manner to the satisfaction of the architect, all damage, which by reason of the taking down of the present North walling, or which by reason of the building of the intended new walling, may occur to the other walling, brickwork, vaults, foundations, and pavings of the church.

3075. Note.—Should it appear upon taking down the present North walling of the church, that any part of the basement-walling or any part of the foundation of the said walling cannot be removed without endangering the stability of the vaultings of the crypt of the church, the architect may, if he deem it expedient, suffer such portion of the said old basement-walling or old foundation, to remain; but in that case, deduction is to be made of the quantity of new brick-work which will consequently be retrenched; and the contractor is to repair and make good in a workmanlike manner to the satisfaction of the architect, all such old basement-walling and foundation as shall be so suffered to remain, he being allowed no charge for so doing, but being considered as remunerated by the saving to him of the expense to which he would otherwise be put in the taking up and removal and the carting away of the said old work and by the saving of the extra risk and danger which he the contractor would otherwise incur.

e §§ 353—365, 1010.)

3076. The whole of the intended new walling is to be done with the very best new approved hard well-burnt grey stock-bricks, without admixture of soft bricks, broken bricks, place-bricks, or other inferior bricks; the whole of the work is to be laid in

and is to be completely flushed up at every course thereof, with mortar composed of the very best Dorking stone-lime, and clean Thames sand, well beaten together in the proportion of two measures of sand to one measure of lime; the whole of the work is to be carried up throughout the whole thickness thereof, in manner of English bond; no four courses of the work are to rise more than one inch exclusive of the height of the bricks; all the external work above ground is to be faced with picked stock-bricks of a bright uniform colour, with all the joints thereof neatly struck and drawn; the brick-work is also to be well grouted with liquid mortar, at every alternate course of the work.

(See §§ 449—462.)

3077. *The new wall is to be built 2 ins. out of perpendicular, falling towards the building, in order to resist the tendency to spread of the imperfectly tiled roof.*

3078. To provide under the contract two rods reduced of stock brick-work (similar to the brickwork herein above described) to be used in such additional works as the architect shall direct, the value of such thereof as may not be so directed to be used, is however to be deducted from the amount of the consideration of the contract, after the rate of per rod reduced.

3079. To repair and point the remainder of the North-walling of the church, in the same manner as hereinbefore described for the Southern-wall thereof; to repair, wash, stop, and lime-whiten twice, all the stucco-work upon the same walling; and to open the ground five feet deep all along the portion of the old North-walling, which is not intended to be rebuilt; to repair under-pin and pin in with sound hard new grey stock-bricks, set in one half by measure of pure quick Parker's cement, and one half by measure of clean Thames sand, all the defects in the foundation, and other parts of the same walling both on the outside thereof, and on the inside thereof next the crypt; and to fill in again and make good the ground after the said repairs, and under-pinning are performed.

Internal scaffolding.

3080. To provide and erect throughout, and over every part of the interior of the church, sufficient safe and complete scaffolding, fixed in a workmanlike manner, with all proper poles, ledgers, braces, putlogs, cords, ropes, and wedges, and with strong boarding over every part thereof, so that the plasterers, painters, and all the other workmen to be employed in the reparation of the church, may at one and the same time reach and perform conveniently all the several works to the whole of the ceilings, walls, and other parts of the church, which are intended to be cleaned and repaired.

External scaffolding.

3081. To provide and erect in like manner, sufficient scaffolding for the intended works to the Northern and Southern walls of the church, for the reparation and painting of the whole of the turret of the church, for the reparation and colouring of the external stucco of the Western and Eastern fronts of the church, and of the vestry-room, and for the execution of all the other works intended to be done in pursuance of this Specification.

Ladders, tackle, &c.

3082. To provide, supply, and maintain to the whole of the

scaffolding, sufficient strong safe and complete ladders for the convenient and free ascent of the several workmen to be employed in and about the church ; and in like manner to provide, supply, and maintain to the said scaffolding, all proper and requisite compound, and other pulleys and blocks, and falls, and all other tackle, wheels, cords, and ropes, which may be requisite for the raising and lowering of the materials to be raised to, or to be lowered from the work.

terations to d removal of e scaffolding.

3083. To alter, adjust, and make good to the several scaffoldings, from time to time, as the several workmen may require for the proper performance of their several works, and finally to take down, remove, and cart away entirely the whole of the scaffoldings, and the ladders, tackle, and other appertenances thereof.

paration of mage.

3084. To repair and make good to the satisfaction of the architect, and in such manner as he shall direct, all damage of every kind which by the erection of the several scaffoldings or by the removal thereof may occur to the roofs, stone-work, or other works of any and every kind, of the church and of the appertenances thereof, or which may thereby occur to any adjoining buildings and premises.

ling.

3085. To strip off the whole of the pan-tiling of the roof over the church ; to take away the whole of the broken, flawed, decayed, and otherwise unsound tiles thereof; to re-tile to a 10½-in. guage the whole of the principal roof of the church, the Eastern and Western ends thereof excepted, using only such of the present tiles as remain sound and undecayed, and providing and applying for that purpose sufficient new sound tiles and sufficient new heart of fir laths ; and to point effectually on the inside thereof every part of the pan-tiling of the roofing over the church, with good Dorking stone-lime mortar with fine smiths' ashes and with hair therein, particular care being taken to prevent the pointing from showing on the outside. To repair and make complete the plain tiling at the Eastern end of the principal roof of the church.

r-pawlings.

3086. To provide and apply to all the roofs of the church during the time the same are being stripped and laid open, tar-pawlings sufficient to prevent all damage by reason of wet to the ceilings of the church.

mney-pot.

3087. To put at the West end of the church a new large-sized chimney-pot set in Parker's cement, and flanched round with plain tiles set also in Parker's cement.

nt, &c. to hings, &c.

3088. To point and make good the brick-work to all the flashings, and to make good all the Parker's cement stucco within the parapets.

rial-ground.

3089. To point with Parker's cement the brick riser to the step up into the burial-ground, and to make good the Yorkshire stone tread to the same step.

bbish, &c.

3090. To clean out from within the roof and over the ceilings of the church, all rubbish and dirt now lying there ; and to remove

and cart away all rubbish dirt and useless materials, which by reason of the execution of the intended works, may accrue within the roof, upon the ceilings, and in and about every other part of the church, and in and about the burial-grounds belonging to the church, and finally to leave the whole of the church and the burial-grounds free therefrom.

Five days brick layer and labourer.

3091. To perform, besides the above work, five days' work of a bricklayer and five days' work of a labourer as the architect shall direct.

MASON. (See §§ 265—295.)

3-in. Yorkshire stone under the foundation of the new North wall.

3092. To provide and bed solidly in mortar beneath the whole of the intended new walling on the North side of the church, two complete courses of Yorkshire stone 4 ft. wide and not less than 3 ins. thick in any part, with the joints thereof laid quite close and as much crossed upon each other as possible; each stone thereof is to be 4 ft. long, and no stone is to contain less than 8 ft. superficial.

Inscription-stone.

3093. To provide and set in the intended new wall a solid block of Portland stone 2 ft. 9 ins. long, 2 ft. high, and 2 ft. 7 ins. thick, wrought with two fair rubbed faces and fair rubbed edges, and with the following inscription cut in the best manner upon two of the faces of the said stone :—

THIS WALL WAS REBUILT AT THE SOLE EXPENSE OF , A.D. .

Coping to the Northern walling of the church.

3094. To complete the coping of the northern walling of the Church with new Portland stone 18 ins. wide, 3 ins. thick on the inside, 4½-ins. thick on the outside, with the requisite solid quoin-stones, throated on the inside, bedded in good Dorking stone-lime mortar, and cramped at all the joints therein with copper cramps each weight at least 8 oz. avoirdupoise, and each run completely all over with lead.

Old copings.

3095. To re-bed as far as requisite and point with Parker's cement all the stone copings of the church, to take away all the present cramps in the copings, and to put to each joint in the copings of the whole church a new copper cramp weight 8 oz. avoirdupoise run completely all over with lead.

External stone-work of the West side lobbies.

3096. To stop and clean all the external stone-work of the two projecting side lobbies at the West end of the church.

Stone skirtings to the Vestry-room, &c.

3097. To re-set, secure effectually to the walls, and make good the stone skirtings against the outside of the vestry-room and against the wall opposite thereto.

SLATER. (See §§ 542—3.)

New duchess-slating to Northern and Southern lean-to roofs.

3098. To take away the present covering of the lean-to roof over the northern wing of the church next the site of the house

lately pulled down, and the covering of the lean-to roof on the southern side of the church; and to put instead thereof the best new strong duchess slating lapped full 3 ins., nailed with strong copper nails, and with proper bond in every part thereof, more particularly at the eaves and at the headings, and without the employment of slates of another kind of bond with narrow slips of slates between them.

and to West end and dormers.

3099. To re-slate in a similar manner with duchess slates all the western end of the principal roof of the church at the parts thereof adjoining to the turret; and to slate in like manner the outsides of the two dormer-ways of the roofing of the church.

Leave slating perfect.

3100. To leave perfect to the satisfaction of the architect, at the final rendering up of the works as complete, all the slater's work of the church.

CARPENTER AND JOINER. (See §§ 337—40.)

New North wall, &c.

3101. To shore up in the most able safe and workmanlike manner, with sufficient labour and timber and other proper materials, the walls, roof, gallery, turret, vaults, and all the other parts of the church which will incur hazard, danger, or jeopardy of any kind by reason of taking down and rebuilding the northern walling of the church; and to remove and take away all such shoring when the said walling is rebuilt.

3102. The wood columns of the church, are immediately above the brick pedestals upon which they stand, to be confined by means of two pieces of timber placed on the sides of each column to form ties, and extending quite across the church, with two blocks, one at the back and one at the front of each column, and a bolt of wrought-iron 1 in. diameter passed through each block and through the ends of each tie, so as to prevent the bases of the column from being either expanded or thrust together.

3103. To put in the intended new northern walling two tiers of the best Memel fir bond-timber on the ground-story, and two tiers of similar bond-timber on the gallery-story, in order to fix thereto the wall-wainscottings; to put in all the brick-work of the intended new walling from the dwarf-wainscotting upwards, tiers of similar bond-timber not more than 2 ft. 6 ins. apart in order to fix the intended battening (omitting however every alternate tier of the last described bond-timber at the part of the walling which will inclose the turret-stairs) each tier of bond-timber is to be in one piece without joints except at the angles, and is to be of scantling 5 ins. by 2½ ins., set to project so that the battens and finishings may not lie close to the brickwork.

3104. To put in the new north walling a plate of the best Memel fir 6 ins. by 6 ins., to receive the timbers of the gallery, and a plate of similar fir 8 ins. by 6 ins., in order to receive the timbers of the roof: to provide and apply as the architect shall direct, in and about repairing and adapting to the new walling, the timbers of the gallery and other parts of the church, twenty-five cubic feet of the best Baltic fir timber.

3105. To batten securely all the new brick-work of the north walling from the dwarf-wainscotting upwards, with inch yellow deal battens 2¼ ins. wide, and not more than 12 ins. apart.

3106. To put to the ground-story of the church all along the new walling new 1½-in. square framed yellow deal wall-wainscotting with ¾-in. panels of the same height as the adjoining wainscotting, and fixed with the requisite ploughed grounds and backings, and finished with capping to match the capping of the adjoining wainscotting. To repair thoroughly, refix with the requisite ploughed grounds and backings, and make complete and perfect all the wainscotting of the stair-case, gallery-story, and other parts of the church, which will be taken down or affected by or in consequence of the rebuilding of the northern wall of the church.

3107. To take down and remove carefully as far as requisite in order to rebuild the north walling, the timbers, floorings, pewing, seats, partitions, inclosures, doors, steps, stairs, and other wood-work of the church, and to refix and make good the same in a complete and workmanlike manner with all requisite reparations, alterations, and additions, and with all proper ironmongery.

3108. The new timber and deal to be used in and about the intended new walling, and in connexion therewith are to be cut out quite square, and perfectly free from sap-wood shakes large knots and all other defects.

3109. To provide and fix for the security of the new north walling as the architect shall direct, 336 lbs. avoirdupoise of wrought-iron in such ties bolts straps and other work as he the said architect shall direct.

2 dormer windows.

3110. To take away the present two sky-lights, and to form in the roof of the church at the north and south sides of the turret, two dormer-windows, each as wide as the same can be made by the removal of one rafter, with 1½-in. yellow deal sashes 18 high, glazed with third Newcastle crown glass, strong framework of Baltic fir, inch yellow deal boarding for lead at the tops and sides thereof, and 6 ins. high at the feet of the windows, and all requisite other work and fittings complete and with all requisite framing and alterations to the wood-work of the roof.

General repairs to the roof, &c.

3111. To examine generally all the timbers and wood-work of the whole of the roofing of every kind belonging to the whole of the church; to provide for and apply in the reparation of the roofing of the church as the architect shall direct, twenty-five cubic feet of Baltic fir timber, and seventy-five superficial feet of inch yellow deal clear of sap-wood; and to provide all nails spikes and labour requisite in order to repair and make good the roofing and gutters of the church.

To refix within the turret the fir-brace which has fallen out from the same.

Northern and Southern lean-to roofs, and West end of the principal roof.

3112. To make complete for the slater the Northern and Southern lean-to roofs of the church, and the hipped Western end

of the principal roof of the church, providing the requisite new ¾-in. yellow deal slate-boarding, clear of sap-wood, and all requisite springers and tilting-fillets.

ormer-ways of roof.

3113. To repair thoroughly the dormer-head of the staircase leading out upon the roof, and the dormer leading into the principal roof of the church: to set upright and make good the quarters and other timbers, with the requisite new Baltic fir timber; to cover the sides thereof with new ¾-in. yellow deal slate-boarding clear of sap-wood; to case over the door-frames thereto with inch yellow deal, and to hang therein new 1¼-in. yellow deal ploughed tongued beaded ledged and braced doors, and to put to each door a pair of 24 in. cross-garnet hinges, and fastenings to each, value 5*s*. exclusive of the fixing thereof.

ters.

3114. To examine all the gutter-boards and bearers of the roof; to alter and relay the same as far as requisite, in order to obtain a fall of at least 1½ in. to every 10 feet run, and 2½ in. drips; to provide all requisite new 1¼ in. yellow deal gutter-bottoms and yellow deal bearers, and to repair generally, and make perfect all the gutters of the roof. To provide and fix two new troughs of 1¼ in. yellow deal to convey the wet from the sides of the turret down into the North and South gutters.

ier doors.

3115. To take down the inner pair of entrance doors at the principal West entrance of the church and the inner pair of entrance doors at the East end of the church, to repair, adapt, fit, and hang the same two pairs of doors with Redmund's patent spring hinges, to open either way, and with all other proper work and appurtenances.

3116. To prepare properly and cover again with baize, value at the prime cost 3*s*. 6*d*. per square yard, the pair of doors at the West end of the middle aisle of the church, and the pair of inner doors at the Eastern entrance of the church; and to panel the said doors on both sides thereof with gilt-headed nails, or with gilt and burnished brass beading, in the form wherein the same doors are at present nailed.

To take off, repair, lacquer, refix, and make good, the brass furniture to the same doors.

To take down, re-fit, and re-hang the doors at the West ends of the side aisles of the church, putting thereto ironmongery to each thereof value 20*s*.

ult doors.

3117. To repair thoroughly and case the entrance doors of the burial-vault under the church; and to put thereto a new best 10-in. copper-warded stock-lock, with three keys: and repair the doors and locks of the coal-cellar and tool-vault.

tern.

3118. To put to the cistern in the burial-ground behind the church, a new yellow deal cover with flap and hinges as at present.

ilting, &c.

3119. To make good the broken coping of the railing of the burial-ground, with new cast-iron coping and the requisite other work.

10 days joiner.

3120. To perform besides the above-recited work ten days' work of a joiner as the architect shall direct.

Kyan's process.

3121. The whole of the new timber to be used in the execution of the carpenter's work is to be prepared by Kyan's process for the prevention of dry-rot.

PLASTERER.

New North walling.

3122. To cover with the very best floated and troweled stucco upon new heart of fir lath-and-half laths, the whole of the internal brick-work of the new north walling of the church from the dwarf wainscottings to the ceilings upwards; and to renew and make good all the other plastering of the church, which will be destroyed or injured by or in consequence of the rebuilding of the north walling of the church.

Wash, scrape, and repair and colour plasterings.

3123. To wash and scrape quite clean and smooth every part of all the ceilings soffits strings mouldings enrichments walls and other plasterer's work of every kind of the whole of the church, and of the galleries, vestry-room, lobbies, and other appertenances thereof; and to repair stop and make good in a thorough and workmanlike manner, all the cracks flaws decays and all other defects in the said ceilings soffits strings mouldings enrichments walls and other plasterer's work above recited, and to bring the whole thereof to a perfect face, and finish the whole of the said plastering in such teints of stone colour as the architect shall direct.

Clean and colour stone lobbies, &c.

3124. To wash, scrape, clean, stop, and teint of a shade of stone-colour, the interior of the stone-work of the sides of the lobbies at the west front of the church, and the inside and outside of the privy in the burial ground behind the church.

External plastering.

3125. To wash scrape clean stop and repair thoroughly in the most secure neat and workmanlike manner, all the external plastering of the west and east fronts of the church, including all the returns breaks reveals string-courses plinths cornices mouldings jambs mullions and other appertenances thereof, and cutting down and renewing all such parts of the said external plastering, as are loose broken or perished: to clean and stop the stone-work of the windows, and to colour all the above recited external plastering and work, in the most excellent manner of a teint of stone-colour, the same being mixed with and secured by beer-grounds, Russia tallow, tar, and the other proper materials.

3126. *The stucco-work last mentioned was done about twenty-five years ago, and is one instance of the meanness and expense of such an application: through being mixed with too great a portion of sand it is rotten, and from having been allowed to become hard before it was coloured, though the colouring of it has been frequently renewed, it has as often been washed off within twelve months afterwards.*

3127. To cut down all the cracked and loose external plas-

tering of the vestry-room, and of the walling opposite thereto; and to wash, scrape, clean, stop, repair, make good and colour the whole of the external plastering of the vestry-room and of the opposite walling in the same manner as described for the western and eastern fronts of the church.

PLUMBER.

milled-lead ew dormer ws.

3128. To cover the tops, sides, and frames of the two intended new dormer-windows with milled-lead, weight full 6 lbs. to the foot superficial, turned down full 10 ins. over the tiling, and sufficiently secured to the wood-work; and to put at the foot of each dormer-window a flashing of similar lead 18 ins. wide.

milled-lead s.

3129. To exchange for new milled-lead weight 7 lbs. to the foot superficial all the following lead-work of the gutters, viz. the 2nd sheet, the 3rd sheet, and the 4th sheet from the East end of the Northern gutter, the Southern sheet of the East gutter, and the 1st sheet, the 2nd sheet, the 3rd sheet, and the 4th sheet from the West end of the Southern gutter.

milled-lead gs 10 ins.

3130. To put all along at the heads of the North and South lean-to roofs of the church, flashings of milled-lead weight 5 lbs. to the foot superficial, and 10 ins. wide; and to put similar flashings in the brick-work at the base of the turret.

and make ead-work lly.

3131. To refix, dress, and make good, the lead-work of the hips and ridge of the principal roof of the church, the flashings and apron of the dormer-head of the stairs leading to the roof, and of the dormer leading into the principal roof of the church, the leaded flat over the vestry-room, and in general all the flashings and other lead-work of the church.

3132. To take away the present rain-water-pipes on the South side of the church, and to put instead thereof two stacks of new 4½-in. cast-iron-pipe, with heads and shoes complete, in order to carry the water from the Southern gutter of the church into the gutter below at the side of the church.

3133. To put from the head of the dormer over the staircase leading out upon the roof a 3 in. cast-iron rain-water-pipe, with head and shoe complete, to lead the water down to the gutter below.

3134. To examine, open, and repair, and re-fix, as far as requisite, all the other pipes of every kind belonging to the church, particularly the rain-water-pipe on the North side of the church; and to take away the wood trunk at the foot thereof, and to put in lieu thereof a new cast-iron rain-water-pipe of bore similar to that of the lead pipe above the same, curved to carry the water down into the drain in the vault, and with shoe complete.

lled-lead gh-gutters.

3135. To line the intended two new trough-gutters at the sides of the turret with milled-lead weight 6 lbs. to the foot superficial.

Turret.

3136. To examine dress and repair as far as requisite all the copper-work and lead-work of the whole of the turret of the church and of the appertenances thereof.

3 cwt. extra lead-work.

3137. To provide and apply in such extra work as the architect shall direct, 3 cwt. of milled-lead, including the labour and all materials requisite in fixing the same.

PAINTER.

Preparation.

3138. To prepare in a proper manner for painting, every part of the external wood-work of the whole of the church, and of the vestry-room, lobbies, and other appertenances of the church, and of all the other works hereinafter directed to be painted, by cleaning, pumicing, smoothing, and stopping all the said works, and by bringing forward the said works in parts where requisite with two extra coats of good oil-colour, and by as many more coats of good oil-colour as such parts of the work may need in order to receive properly and bear out in a workmanlike manner the intended painter's work.

3 times in oil to the new iron-work.

3139. To paint five times with the best oil-colour all the new iron rain-water-pipes and the heads and shoes thereof, and also all the other new iron-work of the church and burial-grounds, the first two coats of colour of all the said painting to the iron-work being done with red-lead paint.

3 times in oil to railings.

3140. To paint thrice with the best oil-colour all the palisades, railings, gates, lamp-irons, standards, curbs, rain-water-pipes, and other old external iron-work of every kind belonging to the church and to the burial-grounds, the first two coats of colour of all the said painting to the said iron-work being done with red-lead paint.

Twice in oil to the external wood-work, turret, &c. of the church.

3141. To paint twice with the best oil-colour, the whole of the external wood-work of every kind belonging to every part of the church, and of the fittings and appertenances of and belonging to the same; and to prepare and paint in like manner every part of the outside of the turret of the church, with all the appertenances thereof.

Grain wainscot and varnish twice with copal, &c.

3142. To grain in imitation of wainscot, in the very best and most artist-like manner, to the satisfaction of the architect, the outsides and edges of all the external doors of the church, the outsides and edges of the pair of gates at the entrance to the burial-ground adjoining , and every part of all the free seats in the middle aisle of the church.

3143. The whole of the grained-work is to be finely combed, and is to be finely figured in every part thereof, and is also to be varnished twice with copal varnish, value at the prime cost thereof 30*s.* per gallon.

3144. To take off, planish, refix, repaint four times in go oil colour, and re-gild *twice* the clock-dial of the turret, and varnish the same twice as described for the outer doors of t church.

nting of wood-k next the r wall.

3145. To paint four times with the best oil-colour, all the new wood-work next the intended new North-wall of the church; and to finish the same to match the present painting.

aning, &c. to internal paint- of the church.

3146. To scour clean every part of the remainder of the internal painted-work of the church and vestry-room, including all the pewings, seats, gallery-fronts, columns, pilasters, entablatures, wainscottings, linings, closets, and other fittings, fixtures, and appertenances of every kind within the said church, and all the offices and appointments thereof; and to repair, re-touch, and make good, to the satisfaction of the architect, all blemishes which may be now in the intended painting above recited, or which may occur thereto by the cleaning thereof, or from any other cause.

tering, &c.

3147. To prepare properly, and paint four times with the best oil-colour, all the tablets at the Western entrance of the church, and the tablet on the wall at the South-eastern corner of the burial-ground, and to write thereon the usual official notices.

3148. To paint and letter in like manner the two large tablets in the North-western and South-western lobbies of the church, each according to the particulars of benefactions hereunder written

To paint and letter in like manner the inscriptions and notices upon and over the entrance-gates of the burial-ground near

GLAZIER.

pairs to win-rs, &c. gene-y.

3149. To take out all the broken and cracked glass of every kind, having more than one single crack in a square, of all the windows, lights, skylights, doors, and partitions of the whole church, and of the vestry-room thereof; and to provide and fix new glass to correspond, with the glazing of the respective windows, lights, skylights, doors, and partitions of the said church, and of the vestry-room thereof, and including the plate-glass in the lobby doors.

3150. To examine carefully all the frame-work, saddle-bars, and lead-work of the several windows; and to repair, secure, and make good the whole thereof.

an, &c. glazing.

3151. To clean on both sides, and leave perfect and free from all cracks and breakage (more than one crack in each pane of the old glass as aforesaid), at the final rendering up of the church as repaired, the whole of the windows, lights, sky-lights, doors, partitions, and other glazing of the whole church and of the vestry-room thereof.

CHAPTER XXVIII.

SPECIFICATION FOR CONSTRUCTING A NEW ROOF *to a* CHURCH.

BRICKLAYER.

Internal and external scaffoldings. (See §§ 2894, 3038—9, and 3080.)

Ladders, tackle, &c. (See § 3082.)

Alteration and removal of the scaffolding. (See § 3083—4.)

Tar-pawlings. 3152. To provide apply and maintain to all the roofs of the church, during the time the same are being stripped and laid open, tar-pawlings sufficient for preventing all damage by reason of wet to the ceilings of the church.

Pulling down, &c. 3153. To take down from the building all the parapets and *(here insert how much of the brick-work is to be taken down as may appear to be necessary after a proper survey of the work itself.)*

Reparation, &c. of walls. 3154. To take off all the unsound brick-work (*if any*) from all the walls immediately below the intended new roofing; and to repair raise and make good all the walls of the church with sufficient new brick-work in order to receive the intended new roofing.

Bedding, &c. 3155. To bed in stone-lime mortar all the plates of the roofing and to point to the same.

(Note. *If the plates lie upon stone-work there should always be sheets of lead placed between the stone-work and all the timber, as stone-work in general imbibes enough of moisture to rot all wood in contact with it.*)

Tiling *(if any).* (See Index.)

Parapets, &c. *(if any.)* 3156. To rebuild the whole of the parapets and other brick-work in and about the roofing of the church in the same form as at present (*or according to the drawings as the case may be*).

Facings *(if any).* 3157. To face the whole of the new parapets and other new external brick-work with the best sound hard well-burnt square bricks to match the other external facings of the church.

Pointing, &c. 3158. To stain all the new brick-work of the outside of the church to match in colour the old brick-work adjoining to the new brick-work; and to point all the new external brick-work with stone-lime very dark coloured mortar which when dry shall appear as nearly as possible in colour like the old joints of the brick-work.

Bricks, mortar, &c. 3159. The whole of the brick-work (except where here otherwise directed) is to be done with the requisite very best s

hard well-burnt grey stock-bricks (*if any of the old bricks are to be used again, add*, and such of the present sound old bricks to be taken down from the present work as will remain sound undecayed and unbroken) set in and flushed up completely at every course with mortar composed of one third by measure of the best stone lime and two thirds by measure of the best river sand, and every alternate course of the work being completely grouted with liquid mortar.

½-rod extra brick-work. (See § 1007.)

Rubbish. (See §§ 3090 and 2893.)

Jobbing-work. (See §§ 3091 and 1011.)

MASON. (See §§ 265—295.)

Taking off, &c. copings, &c. *(if any.)* 3160. To take off all the stone copings from the parapets and of the church.

New copings *(if any)*. 3161. To provide and fix all along the parapet of the church new Portland stone coping 18 ins. wide, 5 ins. thick in front, 3 ins. thick at the back, moulded in front, throated at both edges, and with solid quoin-stones and sufficient additional projections over the attic piers and *(if any)*.

Old copings. 3162. To cover all the remainder of the parapets and with the best of the present copings re-worked at the ends and edges thereof and as may be otherwise requisite, and providing new coping sufficient for making up all deficiency, and corresponding in nature with the old copings.

Cramps, &c. (See §§ 271—84, and 1013.)

Cornice and parapet of stone *(if any and if removed)*. 3163. To take down and remove carefully the whole (*or such parts as may be intended*) of the stone parapets and cornices of the church.

To re-joint and re-work as far as may be requisite, and rub and entirely sand over the sound portions of the said cornice and parapet *(with the blockings, attic-pilasters, balusters, and , if any)* and to reset the same, and to provide and fix new blocks of cornice, new parapet, new balusters, and new sufficient to complete the building and to restore thereto the cornice parapets, balusters, and the whole thereof being of the best new stone (*the kind of stone is to be named*) to correspond in dimensions, scantling, and workmanship with the original sizes and forms, of the cornices, parapets, balusters, and of the church.

3164. In the restoration of the stone-work of edifices, it would seem to be necessary for the architect to direct that the new work shall be in form similar to the *original* work, since when directions were given to form

at the quarries exactly similar to the old capitals a set of capitals of granite for the new upper part of Bow steeple, London, the workmen by a perverse exactness of the wrong kind, construed their orders so literally, that they executed their new work with all the blemishes produced by time upon the foliage of the old capitals: this odd blunder, though it might not have been perceptible to general observers when the work was placed 200 ft. from the ground, was sufficiently vexatious to induce the architect to have the work done twice over, and the set of renewed broken capitals lay for some time within the tower of the church, causing wonder in the observers, which most to admire, the literal exactness or the mistake of the provincial masons.

3165. *Upon a survey of the building the defects of the stone-work being discovered, a more exact description of the requisite new stone-work may be obtained, so that the specification may be more explicit as to the intended quantity of new stone-work.*

SLATER. (See §§ 542—3.)

Old slating. (If any, see Index.)

Imperial slating. (If any, see Index.)

Dutchess slating. (If any, see § 2796.)

Countess slating. (If any, see § 2797.)

Nails bond, &c. (See § 1024.)

Reparation. (See § 1025.)

CARPENTER. (See §§ 337—40.)

Take off old timbers. 3166. To take off from the building all the trusses, plates, and other timber-work of the roofing.

Old timbers. 3167. To examine carefully all the old timbers of the roofing, to select such portions thereof as remain completely sound, undecayed, and perfect, and which agree in scantling, dimensions, workmanship, and fashion with the directions hereinafter contained for the intended new roofing, or which will so agree therewith after having been reworked and adapted.

(If all the timbers are to be new, this clause is to be omitted, but another clause conveying to the contractor the old timber, &c. should be then inserted. See Index.)

New materials. 3168. To provide new materials sufficient for the construction and completion of the intended new roofing and for the performance of the attendant works.

CHAPTER XXVIII.

3169. To provide and execute all work and labour proper and requisite for the thorough completion of the intended new roofing; and to provide, fix, and apply thereto all requisite iron spikes, nails, screws, and other proper ironmongery.

3170. All the oak timber is to be of English growth from and all the other timber is to be the very best yellow fir from Dantzic, Riga, or Memel; all the boardings are to be of the very best yellow Christiana deal, except where herein otherwise directed.

3171. All the timber and deals are to be cut out quite square and perfectly free from the very least sap-wood in any part thereof, and from shakes, large knots, wany edges, and all other defects.

New roof.

3172. To construct to the whole of the church new roofing, according to the working-drawings, with No. , framed principal trusses to the body of the fabric over the clear-story *(if any)* No. return trusses *(if any)* to the principal roof No. minor trusses over the aisles *(or galleries as the case may be)* No. trusses over the stair-cases *(if any)*, and No. other trusses *(if any)*, and to provide and fix all other timbers according to the following scantlings.

		Ins.	Ins.
	Wall-plate of oak, all round the clear-story of the church	8	by 6
	Ditto all round the aisles (or galleries) and stair-cases of oak	6	— 6
No. principal trusses.	No. angles ties of oak		
	No. tie-beams of oak		
	No. principal rafters of oak scantling at bottom ..		
	ditto at top ..		
	No. king-posts *(if any)* of oak scantling at the heads and feet		
	ditto in the waist		
	No. queen-posts *(if any)* of oak scantling at the heads and feet		
	ditto in the waist		
	No. collar-beams *(if any)* of oak		
	No. straining-sills *(if any)* of oak		
	No. principal struts *(if any)* of oak		
	No. secondary struts *(if any)* of oak		
No. return trusses *(if any)*.	No. return-trusses framed with oak timbers of the same scantling as those to the principal trusses.		
No. minor trusses *(if any)*.	No. tie-beams of oak		
	No. principal rafters of oak		
	No. king-posts of oak scantling at the heads and feet		
	ditto in the waist		
	No. struts of oak		
Covering to the roofing.	Pole-plates of oak		
	Purlins to the of fir		
	Ditto to the of fir		
	Rafters not more than 11 ins. apart of fir		
	Ridge and hips (if any) rounded for the lead-work ..		

Ins. Ins.

Boarding for the lead-work *(if any)* of inch yellow deal listed free from sap-wood with rolls 2 ins. diameter for the lateral joints in the lead covering.

Slate-boarding *(if any)* of inch yellow deal listed free from sap-wood.

Slate-battens *(if any)* of inch yellow deal 3 ins. wide.

All requisite tilting-fillets and springers.

Ceiling.

3173. To construct the timbers for supporting the ceiling according to the drawings with

Binding-joists .. .. — by —

Ceiling-joists .. .. — —

Dormers.

3174. To construct to the roofing No. dormers, with oak proper frames 5 ins. by 4 ins. oak-plates 4 ins. by 4 ins. oak quarters and joists 4 ins. by 2½ ins.; to cover the tops and sides of the dormers with inch yellow deal, and to fit up the dormer door-ways with inch oak wrought beaded cross-tongued and ledged doors, hung each with a pair of strong 20 in. cross-garnet hinges, and a strong bolt.

[5 cubic feet extra timber.]

(See § 1071.)

PLASTERER.

3175. *If the ceilings are to be entirely destroyed, and be intended to be restored of the original form of the ceilings, accurate drawings should be taken of the original ceilings before they are destroyed; and all the ornaments of the new work should be modelled from portions of the old work, and even many of the original enrichments themselves which in old buildings are often freely modelled in profuse variety of design, and of excellent materials, and not the least decayed, may be used again.*

New ceilings, &c.

3176. To counter-lath where requisite and lath with heart of fir lath-and-half laths *(or with heart of oak laths)* and to plaster float and set wholly with gauged stuff, new ceilings to the whole of the , including all the arches groins beam-work panels compartments and according to the drawings; and to finish the whole thereof with mouldings and with enrichments flowers leaf-work and accurately modelled, cast solid in plaster of Paris; and to securely fix all large leaves and other heavy enrichments, each thereof having at least two strong copper screws to secure the same.

Old ceilings, &c.

3177. To cut down all the broken and otherwise defective plastering of the arched groined paneled and other ceilings of the , and to scrape, wash, clean, stop, repair thoroughly; restore, and make complete, all the said ceilings and other plasterer's work, including all the mouldings, enrichments, flower-work, and appertenances thereof.

[redacted]

ıPTER XXIX.

PLUMBER.

ıg of flats ıping roof- of lead).

3178. To cover the flats and all the sloping or raking sides of the roofing, with cast-lead weight full 8 lbs. to every foot superficial thereof with all the sheets of the lead rolled together full 6 ins. at their lateral joints, and with all their heading-joints lapped full 4 ins. over each other.

3179. *The proper quantity which the heading-joints of the lead-work should lap over each other depends upon the pitch of the roof, and should never be less than* 3 *ins., and in roofs of very low pitch should be full* 6 *ins.; but in all leaded flats or roofs nearly level, each heading-joint of the lead-work must also have a drip of* 2½ *ins. to prevent the penetration of wet: no soldered joints should ever be used across any new lead coverings or gutters, as the alternate expansion and contraction of the metal will soon draw the lead-work apart at all such soldered joints, and new lead-work soldered together is little better than old work after being repaired.*

s and flats. (See § 3014 and 3018.)

nd ridges. (See § 3016.)

ıgs. (See § 3015.)

ashings. (See § 3017.)

rs. (See § 3021.)

ıhts. (See § 1847 and 2324.)

nails. (See § 2637.)

CHAPTER XXIX.

ECIFICATION *for* TAKING DOWN *and* REBUILDING *the* UPPER PART *of the* WER *of the* CHURCH *of* *in the County of*
for certain repairs and other works connected therewith.

BRICKLAYER.

ding, &c.

3180. To provide, erect, maintain during the carrying on of the works, alter from time to time as may be found requisite, and finally remove when so directed by the architect, a complete and safe scaffolding round the whole of the church-tower, from the ground to the top thereof, with all requisite poles, braces, ledgers, putlogs, boards, ladders, cords, wedges and other proper appertenances; and to provide and maintain for the use of all the work-

men, proper and sufficient tackle, ropes, blocks, falls or other machinery, needful for raising the bricks stone and other materials and things which will be required for the performance of the works; to make good all damage which may be caused to the building or to the materials thereof, new or old, by the insufficiency of the ropes, tackle, ladders, or scaffolding, or by accident in consequence of the performance of the works; and to make good in like manner all damage of every kind which may be caused by the removal and taking away of the scaffolding and the appertenances thereof.

Take down upper part of tower.

3181. To take down in the most careful manner, without damaging breaking or destroying any part thereof, the various materials composing the parapet of the church-tower, the whole of the present bell-chamber or upper story of the tower, and as much of the tower below the bell-chamber as is indicated by the drawings: to take down also the stair-case-turret with the steps within the same, as low as the floor of the present bell-chamber, and as much lower as may be requisite in order to remove any rents or settlements therein, yet nevertheless not lower than the general height to which the general walls of the tower are to remain.

3182. To carefully stack up apart and arrange upon the ground, the old stone-work as shall be by the architect directed, in the order in which it will be taken from the building, so that the masons may readily find the old work again for use.

New brick-work and flint-work.

3183. To rebuild the whole of the parts of the tower and stair-case-turret herein directed to be taken down, with the most approved, new hard grey stock-bricks (without any admixture of soft bricks or other inferior bricks) the whole to be done in the manner of English bond laid in the closest possible mode, in mortar compounded of one third by measure of the best (*Dorking*) stone-lime and two thirds by measure of clean river sand: the whole of the new brick-work is to be grouted at every alternate course of the work with liquid mortar of the same description: the outside of the work is to be toothed all over four inches deep, by the different courses of the work each alternately projecting four inches over the course below the same, and is to be filled in flush between the quoin-stones, and other external stone-work, with flint-work as at present, done in the neatest possible manner, with small flints set round the larger flints in order to render the outer surface of the work more uniform: a piece of strong iron hooping 2 ft. long dipped in melted pitch is to be put to every foot superficial of the new work in order to secure the flints from falling.

3184. It is apprehended that by a careful use of the present old flints, sufficient of them will be found for the new work; but they will be required to be broken afresh, so as to give the new work a clean appearance; but if requisite a portion of the old chalk will be suffered to be used again to back in with the flints.

Make good walls to new lower window-cases.

3185. To make good the walls with brick-work to the new lower stone window-cases.

Repair flint-work.

3186. To repair where defective the old flint-work all round

the four sides of the tower, and particularly to the new strings, labels, quoins, and arches; and to provide new flints sufficient for making good any deficiency which may be found in the present flints.

Stop-holes in tower.

3187. To fill up the small apertures at the different sides of the tower with solid brick-work, with flint-work facing thereto.

Cut out, &c., for girders.

3188. To cut out for and make good with brick-work the walls of the tower, for the reception of the girders, and other timbers of the intended new belfry-floor.

Lime-whiting.

3189. To lime-whiten twice the whole of the interior of the two stories of the tower, intended when rebuilt to form together the bell-chamber.

½ Rod extra brick-work.

3190. To provide under the contract for the works half a rod reduced of the best brick-work, in addition to that which will be requisite fully to complete the intended restoration of the tower, to be used in such extra works as may be by the architect hereafter directed to be done; the value of such of the said extra brick-work as may not be so directed to be used, is however to be deducted from the amount of the consideration of the contract after the rate of per rod reduced.

Rubbish. (See § 3224.)

3191. To clear away all rubbish, old chalk, and other useless spare materials of every kind; and to leave the burial-ground clear, and make up the same properly after the completion of the work.

Repair damage to roof of church.

3192. To repair all damage which may by the performance of the works occur to the tiling of the church.

MASON. (See § 265—295.)

3193. It is judged that by a careful preservation of the present stone of the tower from injury in the taking down thereof, sufficient stone will be found (added to that described in this specification as intended to be new) for the completion of the whole work, and if upon the old work being taken down the stone should be found to fall short in quantity, the contract will be considered as fulfilled if the quoin-stones be replaced not more than alternately 6½ ins. and 11 ins. in thickness, except the quoins of the buttresses which must show the present average return thickness, but may be sawn away diagonally at their backs in order to save stone.

But should there finally appear any deficiency from decay or any other circumstance, in the quantity of the stone-work required for the restoration of the tower, the contractor is to provide sufficient new stone of good quality similar to the present stone of the tower in order to render the work complete.

New Portland stone window-cases to the upper two stories.

3194. To take out all the window-cases of the story beneath the bell chamber, and to reinstate according to the drawings the

whole of the window-cases of the present upper two stories of the tower with the best hard Portland stone.

Yorkshire stone band. (See §§ 2022—2.) or of Castle-hill stone.

3195. To put all round the four sides of the tower two complete layers of fine tooled 4-in. Yorkshire stone each 2 ft. 9 ins. wide, with close rubbed joints crossed in the different layers as much as possible, wrought externally (after the new work has settled) to form a string moulding according to the drawings and with weathered top with proper water-joints channeled and run with lead; and to let into the Yorkshire stone the collars of the chain-bar and run the same with lead.

Quoin-stones and facings.

3196. To put to the whole of the new part of the tower, quoin-stones and other stone-facings according to the drawings, and as nearly like the original work of the old fabric as possible, formed of the present stone of the building *(or of new stone similar thereto)* but entirely re-worked and rubbed on the fronts, ends, and beds thereof, and freed from all decay.

New corbeille-cornice of Yorkshire stone. (See §§ 2022—2.) or of Castle-hill stone.

3197. To put all round the four sides of the tower a new corbeille-cornice, to support the projecting parapet, composed of two layers of fine tooled 3-in. Yorkshire stone each 1 ft. 9 ins. wide, and one layer of fine tooled 6-in. Yorkshire landing 1 ft. 4 ins. wide; all the joints thereof are to be rubbed, to be crossed as much as possible upon each, and to be double plugged with lead at every joint; and the whole of the said cornice is to be finely tooled according to the profile shown by the drawings.

Coping.

3198. To replace and make complete the coping round the whole of the parapet, with the requisite additional coping in lieu of those parts of the present coping which may be found defective: the whole to be re-worked, re-jointed, and double plugged with lead at every joint thereof.

Stair-case-turret.

3199. To restore the stair-case-turret, with the quoins and other stone-work thereof, as nearly as possible like the present building; to refix, make complete, and re-work where requisite, those steps which will of necessity be taken down; and to provide and fix twelve new steps of Purbeck stone in lieu of the most defective or damaged of the present steps. To repair, re-work, and refix the loop-hole-cases to the stair-case.

Twelve new Purbeck steps, &c.

Water-tablings.

3200. To make good the water-tablings where the upper part of the stair-case-turret changes in form.

4½-in. Portland stone covering to stair-case.

3201. To provide and fix a complete covering for the stair-case-turret, consisting of one piece of Portland stone 4½ ins. thick, sunk away on the top thereof to the outside 1½ in. down, and with proper tooled and throated edges.

Repair North-western buttress.

3202. To replace all the quoins of the remainder of the North-west buttress (those which are not quite decayed at the face only excepted) with stone of the average thickness of 8 ins. properly tooled over the faces thereof, and backed up where requisite, and grouted completely in with either the spare flints or with the large cuttings of the stone: to tool over quite fairly

all the stones of the same buttress which will not require to be taken out.

ables to es.

3203. To put to the whole of the buttresses new fair tooled stone water-tables at every set-off, profiled in front according to the drawings, and lapped at the different beds in a proper manner.

3204. To restore all the decayed parts of the lower moulded string-course by cutting out the old stone to at least 8 ins. in depth, and by replacing the same with stone worked of the original profile.

, &c., to uildings West and en- loors.

3205. To cut out in a careful manner to a depth not less than 6 ins., the label-mouldings of the large Western window and of the doorway beneath the same; to restore the two label-mouldings as nearly as can be ascertained to the original profile; to face over with fair tooled work, the stone-arches above the large window, cutting out and replacing to the depth of at least 8 ins. such parts thereof as are too much decayed to be properly reworked; to rework over in the most exact and correct manner without injuring the same, and to rub smooth the whole frontispiece of the Western doorway; and to replace in a workmanlike manner such stones thereof as are so far decayed as to be unfit to be reworked; and to make good the walls up to and around the new labels and other stone-work of the Western door and Western window as described to the quoins and strings.

SLATER. (See §§ 542—3.)

3206. To slate the roof of the tower, with the best new strong dutchess slates nailed with copper nails, and to leave the same perfect at the completion of the whole of the works.

CARPENTER. (See §§ 337—40.)

ff roof and ors.

3207. To take off the present roof and the upper two floors of the tower.

bells, &c.

3208. To take down and lower carefully to the ground the whole of the old bells with their carriages and other appertenances for the use of the bell-founder.

e lower r bells.

3209. To replace the lowermost of the two floors with two new oak girders each 20 feet long and scantling 14 ins. by 12 ins.; to provide and fix to this floor ten feet cube of new oak in templets ties or other work; to lay upon the girders joists formed of the best of the joists of the two old floors, trimmed for a well-hole as shown in the plan; and to lay the whole floor with the sound parts of the planking of the two old floors with the requisite new material of the same description to make up any deficiency: the part of the planking over the well-hole is to be hung as a trap-door with a pair of very strong wrought-iron hinges and is to have an iron ring.

Centering.

3210. To provide and fix ribbed centering for turning the arches of the new windows.

Roof.

3211. To replace the roof of the tower using the present materials as far as the same are sound; to put a new wall-plate of oak scantling 6 ins. by 8 ins., four new oak angle-ties 6 ins. by 8 ins., each 12 ft. long, one angle-beam of fir 12 ins. by 8 ins. and 30 ft. long to pass over the angle-ties and receive the end of the vane-staff, and four new hips of 2 in. deal 10½-ins. wide rounded for lead; to put new rafters of fir 6 ins. by 3 ins. in lieu of those rafters which are unfit to be again used, and new fir pole-plate 5 ins. by 5 ins.

To board the roof with inch yellow deal slate-boarding clear of sap-wood.

3212. To form the gutter round the roof with 1¼-in. yellow deal gutter-board and very strong bearers current 2½-ins. in 10 ft., 2½-in. rebated drips in the situations shown by the plan, and with a cess-pool formed at the head of the rain-water-pipe.

Belfry-windows.

3213. To put to each light of the seven belfry windows a proper wrought and framed oak window-case, scantling 5 ins. by 4 ins., filled in according to the drawings with 1¼-in. wrought and framed oak louvre-boards 8 ins. wide.

Doors to turret-stairs.

3214. To put to the belfry and to the head of the turret-stairs new oak proper door-cases 5 ins. by 5 ins., and new 1¼-in. deal wrought tongued and ledged doors, hung complete with strong hinges; the upper door is to have a strong bolt, and the belfry door is to have a good copper-warded stock-lock with two keys.

SMITH.

Chain-bar, &c. (See §§ 285—290.)

3215. To provide and lay round the tower upon the Yorkshire stone bond, a chain-bar of wrought-iron scantling 3 ins. by ⅜ in., with angle-ties of the same scantling, each 6 ft. long, the whole to consist of only eight pieces; to have four large collars of wrought-iron at the angles: the angle-ties are to be framed into the chain-bar, and are to be run with lead.

Angle-tie.

3216. To put one angle-tie of wrought-iron 1¼ in. square, and 32 ft. long, to pass through the wood angle-beam beneath the vane-staff.

2 cwt. ties additional.

3217. To provide and fix 224 lbs. in addition of wrought-iron straps, ties, and bolts, for such parts of the work as the architect may direct.

Vane.

3218. To repair thoroughly the old vane and the standard thereof, and refix the same to the new roof of the tower.

[redacted]

HAPTER XXX.

PLUMBER.

3219. To take off the present lead-work of the tower, and to lay to the new roof thereof cast-lead gutters weight 8 lbs. to the foot superficial, turned up 7 ins. high against the parapet and 10 ins. next the rafters, and under the slates; to put a flashing of 5 lb. milled-lead 6 ins. wide all round the gutter; to cover the hips of the roof with 5 lb. milled-lead 20 ins. wide; and to put at the summit of the roof a 5 lb. milled-lead cap 2 ft. 6 ins. square; to put from the roof of the tower a stack of new rain-water-pipe 4 ins. bore formed of 10 lb. milled-lead with a strong large ornamental Gothic head and 12 ft. of cast-iron pipe at the foot next the ground, and with a proper shoe complete.

PAINTER.

3220. To paint four times with red-lead and oil paint the chain-bar iron-ties and other new iron-work of the tower; to paint in the like manner the cast-iron lower part of the rain-water-pipe, and the vane and vane-standard; to finish the same once extra in common colour, and to double gild the vane and its metal adjuncts; to paint four times in oil-colour the new louvre-boardings and frames of the belfry, and the doors and frames of the turret stair-case.

CHAPTER XXX.

ECIFICATION OF WORKS *to be done to the* PARISH CHURCH *of the County of* *in the* ADDITION THERETO TWO SMALL TRANSEPTS AND A SMALL CHANCEL *according to the Drawings the Architect and in the performance of certain other alterations to the said urch.*

(Insert list of Working-drawings. See § 986.*)*

BRICKLAYER.

ling down, &c. 3221. To take down carefully as much of the walls of the church as will require removal in order to carry into execution the intended additions and alterations to the church: to break up and clear away the present foundations of the walls as far as may be requisite in order that the intended new walls and counter-arches may not bind upon any of the old walling and foundations.

materials. 3222. To sort carefully all the old brick and stone which will result from pulling down and removing such portions of the church as will so require in order to carry into execution the intended additions and alterations to the church; to clean and to stack up to be again used, such of the old bricks and stone as will

remain sound and fit to be again used; and to remove and cart away from the church and from the church-yard all the useless materials, and also all the rubbish which will from time to time during the performance of the intended works accrue in and about the church and the church-yard.

Rubbish, &c.

Digging, &c. &c.

3223. To dig out for the foundations of the intended additions to the church, the ground to the depths and widths requisite for the reception of the intended new brick-work; to remove from the foundations and sites of the intended additions, all impediments of every kind; to ram down hard and render solid and level, the bottoms of all the trenches for the reception of the foundations; and when the foundations are laid, to fill in and make up the ground to proper levels, both within and without the building, as shown by the drawings; and to remove and cart away from the church and the church-yard, all the superfluous earth and whatsoever else may be dug out of the foundations.

3224. *(A place, if possible, in the church-yard should be assigned for the deposition of the spare earth and human remains which are found on digging in a church-yard for any new foundations, the removal of which to a secular place is held to be an indecency.)*

Indents, &c.

3225. To cut and parget in the old walling, proper perpendicular indents chasings and tongues in order to receive and to keep steadily the intended new walling; and to repair with sound bricks all the shattered or otherwise defective portions of the old walling which will immediately adjoin the intended new work.

Stop up old window.

3226. To stop up with new sound brick-work set in one half new quick Parker's cement and one half sand, bonded in regular courses into the old brick-work, the remaining portion of the window-opening which is on the south side of the church adjoining to the intended new transept and which window will require to be taken away in order to carry into effect the intended additions to the church.

Windows removed.

3227. To cut out the brick-work of the north and south sides of the church near the western end thereof, in order to admit two of the present stone window-cases in the situations shown by the drawings; and to repair and make good the brick-work to the same in a careful sound and workmanlike manner.

New brick-work.

3228. To execute in the most careful and workmanlike manner the intended new walling and other brick-work of the intended two new transepts and of the intended new chancel of the church, of the several heights, thicknesses and forms shown by the drawings, and with arches counter-arches piers reveals recesses breaks and chamfers also as thereby shown. The whole of the external chamfers are to be properly cut and rubbed quite smooth and fair.

Ventilation.

3229. To provide and fix in the brick-work for the ventilation No. cast-iron gratings according to a pattern to be provided by the architect, and each value 5*s.*; to carry up in the brick-work an air-flue to prevent rain from beating into the venti-

lator from the outside to each grating worked quite fairly on the inside and with chamfering at the external orifice round the grating.

Fascias & blocks.

3230. To finish the insides and outsides of the walls of the two new transepts, and of the new chancel, with brick projecting fascias with chamfered edges, blocks under the same, each composed of a heading-brick shaped according to the drawings and rubbed smooth.

Bedding, &c.

3231. To bed and point with mortar the bond-timber, plates, stone-work, and other work, to be set in the brick-work; and to bed in and point round with lime and hair mortar, the frame of the intended new doorway.

Piers, cross-walls, &c.

3232. To put piers of brick-work not more than 3 ft. apart as shown by the drawings, for the support of the sleepers of the flooring; and to put also for the support of the steps and paving cross-walls as shown by the drawings.

Iron-hooping.

3233. To provide and work up in the brick-work where the architect shall direct, 5 cwt. of wrought-iron vat-hooping.

Tiling.

3234. To strip the present roofing of the church from the East end thereof to about the West sides of the new transepts, and to re-tile the parts of the roofing so stripped, (with the exception of the portions thereof over which the roofs of the transepts will extend,) using again only the best of the present tiles, and making good the lathing where requisite.

Bricks.

3235. The brick-work is to be executed of such of the old bricks, to be of necessity taken from the present building in order to carry into effect the intended additions and alterations, as may remain sound undecayed and fit in the judgment of the architect to be again used in the new work; and in addition to the said old bricks, a sufficient quantity of new bricks of the best quality, sound square well-burnt and such as the architect shall approve of, are to be provided by the contractor in order to complete the whole work. (*State the name and nature of the bricks.*)

Mortar.

3236. The whole of the new brick-work (except where herein otherwise directed) is to be laid in and to be entirely flushed up at every course thereof with the best mortar composed of one third by measure of the best well-burnt lime, and two thirds by measure of the best sand, well beaten together; and the brick-work is to be thoroughly grouted with liquid mortar at every alternate course thereof.

Mode of doing the work. (See §§ 353—365.)

3237. The whole of the brick-work is to be laid as close as possible, entirely in manner of English bond, no four courses of work rising more than one inch besides the height of the bricks; and all the external surfaces of the work are to be executed in the neatest possible manner, with full joints neatly struck, and with all the splays and quoins made and rubbed in the most exact manner.

Lime-whitings.

3238. To lime-whiten twice all the new and old external

brick-work of the church. *(The old brick-work of the church was lime-whited.)*

Jobbing-work. (See §§ 1011 and 3091.)

1 Rod extra brick-work. (See §§ 1007 and 3078.)

MASON. (See §§ 265—295.)

Old windows. 3239. To take out carefully and remove from the present walls of the church, the altar-window and the two windows which are opposite each other next the altar-window; to repair thoroughly all the stone-work and iron-work of the said three windows; to refix and make complete the present altar-window in the gable wall of the intended new northern transept; and to refix and make complete the other two old windows opposite to each other by the gallery of the church in the situations shown by the drawings.

New windows. 3240. To provide fix and make complete in the vestry and in the gable-walls of the new chancel and new South transept, three window-cases according to the drawings, with sills jambs mullions arches and label-mouldings of the very best hard Portland stone, wrought and rubbed quite fairly, with plates of 4 lb. milled-lead laid in all the horizontal and arch joints thereof, and also with strong copper plugs in all the horizontal joints thereof; each window-case is to have saddle-bars and a casement with hinges and fastenings complete, all of wrought-iron dipped in melted pitch (*or tinned over*).

Doorway. 3241. To put to the chancel-doorway a step scantling 7 ins. by 10 ins. and a label-moulding according to the drawings, both of the best hard Portland stone properly rubbed, the step being mortised out to receive the ends of the door-posts.

Paving, &c. 3242. To lay the open avenue of the church (where boarded flooring is not intended to be placed) with the grave-stones at present on the site of the intended additions to the church, and with new 2 in. rubbed Castle-hill stone sufficient to make up all deficiency in the paving.

3243. To put in the paving of the centre avenue of the church, near the transeptal cross aisle, two steps of the best hard and compact rubbed Yorkshire stone as shown by the drawings.

SLATER. (See §§ 542—3.)

3244. To cover the roofs over the intended new chancel and over the intended two new transepts of the church, quite up to the leaded valleys thereof, with the very best strong dutchess slates

secured by strong copper nails and with proper similar bond in every part, particularly at the eaves and at the heading-courses thereof, with cut slates instead of having as more usually is the case dutchess or other slates laid lengthwise with narrow slips of slate between them.

3245. To make good to the satisfaction of the architect all damage which may during the progress of the works occur to the slating, and to leave the slating perfect at the final rendering up of the works as complete.

CARPENTER AND JOINER. (See §§ 337—340.)

New materials, &c.

3246. To provide sufficient new materials for and frame fix and finish all carpenter's work and joiner's work which may be requisite for carrying into effect and for finishing in every respect the intended additions and alterations to the church; and to make all the carpenter's work and joiner's work complete with all nails spikes screws and other proper ironmongery of the very best quality.

Timber and deal.

(See § 1031.)

Old materials.

3247. All the old timber and wood which will of necessity be taken down and removed in order to carry into effect the intended additions and alterations to the church, may be used in the new work as far as the same shall turn out sound undecayed and fit to be again used.

Sundries.

(See §§ 1032—3.)

Iron-ties, &c. (See § 1277.)

3248. To provide and fix in and about the intended works 6 cwt. of iron in such ties screw-bolts and other light wrought and hammered work as the architect may direct.

Hoarding and shoring.

3249. To inclose the works while the same are being carried on, by a substantial wooden hoarding 6 ft. high, and to remove and take away the same, at the completion of the works, or at such time prior thereto as the architect may direct.

To provide, fix, maintain, and finally remove when no longer required, such shoring as may be required for the support of the roofing and other parts of the old building as may require support during the carrying on of the intended works.

Centering.

3250. To provide, fix, ease when directed, and finally remove, all centering requisite for turning the arches and counter-arches.

Wood-timber, &c.

3251. To put all round the walls of the intended new chancel and two intended new transepts of the church, two complete tiers of fir bond-timber scantling 4 ins. by 2½-ins. properly lapped and spiked together; and to put in the new brick-work all requisite wood-bricks.

Roof over the chancel and transepts, &c.

3252. To construct new roofs over the intended new chan-

cel and two new transepts, with wall-plates 5 ins. by 4 ins., tie-beams composed of portions of the tie-beams which will be removed from opposite the two new transepts, wrought and chamfered pole-plates 4 ins. by 4 ins., twelve wrought angle-ties each 5 ft. long scantling 4 ins. by 4 ins., wrought and chamfered king-posts 8 ins. by 4 ins., wrought and chamfered principal-rafters 5 ins. by 4 ins., wrought and chamfered struts 4 ins. by 3 ins., wrought and chamfered purlins 5½ ins. by 3½ ins., wrought and chamfered rafters 3½ ins. by 2½ ins. with shaped ends, wrought ridges 6½ ins. by 1¼ in. inch deal wrought slate-boarding, four fir wrought and chamfered valley-pieces 8 ins. by 4 ins. and all requisite tilting-fillets springers and other proper appertenances. To alter make good and adapt to the roofs of the new transepts the present roofing of the church.

Flooring of the chancel, transepts, and vestry.

3253. To floor the compartment of the altar, the intended vestry-room, and the pews and free-seats in the intended new chancel and the two intended new transepts, with oak sleepers 3½ ins. by 5 ins., and fir joists 2½ ins. by 4 ins., and to lay the whole of the said flooring with 1¼ in. yellow deal wrought flooring-boards listed clear of sap-wood, and with the addition to each free-seat of a gusset-bearer of 1½ in. deal over each joist, and with a riser of inch deal to the front of each free seat. The present flooring of the altar may be used again as far as sound and fit to be so used.

Old floorings.

3254. To repair and make good and complete as far as requisite, and in a substantial and workmanlike manner, the other floorings of the church, at all the parts thereof where the pewing seats, pulpit, reading-desk, clerk's desk, and other appertenances of the church are intended to be altered or re-arranged.

Belfry-floorings.

3255. To construct a floor to the belfry over the intended vestry-room with one trimming-joist 10 ins. by 5 ins., one trimming-joist 9 ins. by 4 ins., and other joists 9 ins. by 2½ ins., and to lay all the same flooring with 1½-in. rough yellow deal clear of sap-wood and ploughed and cross-tongued.

Vestry room, &c.

3256. To inclose the intended vestry-room and the two closets thereto attached, with 2 in. deal square framed partitions two panels high, each panel of ¾-in. deal neither glued nor more than 10½ ins. wide; and to provide and fix in the said partitions, four 2-in. deal four-panel square-framed doors with ¾ in. deal panels, 4 in. butt-hinges, best 7-in. iron rimmed three-bolt locks with key and strong plain brass furniture; and to put round the same doors the requisite beaded stops.

To put in the vestry-closets such fittings of the value of 20s. as shall be by the architect directed.

Gallery.

3257. To alter the northern wing of the gallery of the church, and to reconstruct and fit up the same for the reception of children, according to the drawings, with six ranges of flooring each range thereof 6 ins. higher than the next lowest range; and to raise one step higher than at present, the flooring of the avenue between the northern and southern wings of the same gallery; the present flooring of the gallery is to be used again as far as the same remains sound and good, and all deficiency therein is to be

made good by joists bearers flooring-boards and rises of the same description as those described for the other intended new free seats.

3258. To put to the northern wing of the gallery, five seats each 7 ins. wide, and one seat 9 ins. wide, the whole of the seats to be of 1¼-in. deal wrought rounded and fixed each upon three 1¼-in. deal brackets, and with an 1¼-in. deal framed upright end to each seat 3 ft. high with a shaped top.

3259. To cover over the whole length of the outside of the gallery-front with three panels for tables of benefactions, each of a piece of ¾-in. Honduras mahogany 2 ft. wide and 6 ft. 2 ins. long with framed and chamfered margin of 1½-in. deal round the same; and to finish the whole length of the gallery-front with an embattled gothic moulding according to the drawings.

To move and refix one of the posts beneath the gallery, so as not to obstruct the entrance into one of the intended new pews.

ılt, &c. 3260. To take down, repair thoroughly, alter as occasion may require, remove to the situations shown by the drawings, and make complete the pulpit, the reading-desk, and the clerk's desk, with the stairs, steps, seats, inclosures, and all the other fittings and appertenances thereof.

s. 3261. To take down such portions of the pewings and the appertenances thereof as will require removal in order to carry into effect the intended alterations thereto; and to fit up and make complete the intended pews in the new chancel and other parts of the church, according to the drawings, with partitions, inclosures, doors, hanging-styles, seats, book-boards, hinges, and the other proper and requisite fittings and appertenances composed of the present materials of the pewing intended to be removed, as far as the same shall be found undecayed, sound, and fit to be applied to the purposes of the works, and providing and fixing in and about the work all requisite new partitions, inclosures, doors, hanging-styles, seats, book-boards, hinges, and other proper hinges, and other proper and requisite fittings and appertenances.

To line over with ¾-in. deal grooved, cross-tongued, and beaded, the back of the inclosures of the old pewing next the Northern transept.

-seats. 3262. To fit up the two intended new transepts, according to the drawings, with 1¼-in. deal wrought and rounded free-seats 12 ins. wide, fixed upon 1¼-in. deal wrought and shaped brackets not more than 2 ft. 6 ins. apart, with 1½-in. deal wrought chamfered framed and shaped ends, 1¼-in. deal chamfered skeleton-framed backs to the detached seats, inch deal kneeling-boards 6 ins. wide fixed on strong bearers, and inch deal book-boards 4½ ins. wide with beaded capping and securely fixed with neat cut brackets.

To put in the chancel and other parts of the church, free benches according to the drawings, with seats upon brackets in all respects as described for the other free-seats.

nscotting 3263. To alter, repair thoroughly, adapt, refix, and make

good to the intended new pewing, the present old wainscotting intended to be taken down from the church in order to carry into execution the intended additions and alterations thereto; and to provide and fix to the new pewing such new wainscotting to correspond with the other wainscottings as will be requisite in order to fit up and furnish the said pews with proper wainscotting and with capping backs and all requisite appertenances.

Altar.

3264. To refix and make good the present rail bars and wickets of the altar, and to provide and fix new railing and bars sufficient for completing the inclosure of the altar.

To put to the two niches at the side of the altar-table, seats of 1¼-in. deal with shaped and moulded fronts of 1¼-in. deal in order to support the same according to the drawings.

Chancel door.

3265. To put to the chancel an external 1¼-in. deal ploughed cross-tongued, beaded, and braced batten door, in a fir wrought and chamfered door-case 6 ins. by 4½ ins., with a pair of strong wrought-iron ornamental gothic strap hinges to extend over the whole width of the outside of the door, and two thirds over the width of the inside of the door, and with a good strong 10-in. copper warded draw-back lock with brass knob, two keys, and an ornamental Gothic plate escutcheon.

25 Cubic feet extra fir timber.

(See § 1071.)

PLASTERER.

Stucco work.

3266. To execute in the best floated and trowelled stucco all the new internal brick-work from the wainscottings to the roof upwards with all the reveals, arched-work, splays, arrises, and other work thereof.

PLUMBER.

3267. To cover the ridges of the new roofs with milled-lead weight 5 lbs. to the foot superficial, and 18 ins. wide, properly secured by lead-headed nails; and to lay the valleys with 8 lb. cast-lead 24 ins. wide. (For eaves'-guttering and rain-water pipes (*if any*) see §§ 1206, 1712, 2631, and 2632.)

GLAZIER.

Old glazing.

3268. To reglaze the two windows intended to be placed at the Western part of the church, and the window intended to be placed in the new Northern transept, using for the same the present glass which will remain sound and unbroken, and providing new glass similar to the present glass sufficient for making up all deficiency.

New glazing.

3269. To glaze the windows of the new chancel, new South-

ern transept, and intended vestry-room, with the best new crown glass.

work, &c. 3270. The glass of all the six windows above described is to be set in strong church lead-work, and is to be secured to the saddle-bars by sufficient strong copper bands.

(If the church is to be generally beautified, the requisite additions are to be made to the specification.)

PAINTER.

times in oil n work. 3271. To scrape from rust, prepare properly, and paint five times with the best oil-colour all the saddle-bars and other iron-work of the windows and other new parts and altered parts of the church and of its appertenances, the first three coats of colour being red-lead paint.

times to new work. 3272. To paint four times with the best oil-colour all the new wood-work of the doors, pews, seats, wainscotting, roof, and the other new wood-work usually painted of the whole of the church and of its appertenances.

CHAPTER XXXI.

CIFICATION OF THE WORKS *to be done in forming an* ADDITIONAL WING *to a* .PEL *situate at* *in the Parish of* *e County of*

BRICKLAYER.

let-surveyor. (See § 987.)

ut, &c., -wall of l. 3273. To cut out carefully the brick-work of the flank-wall of the chapel, in order to lay the intended additional wing-building into the present building; to make good the brick-work all along in order to receive the intended granite sill at the foot of the opening; to make good in a careful manner with sound stock-brick-work set in one half new quick Parker's cement and one half clean Thames sand, the two jambs at the ends of the large opening, and the brick-work of the wall above the intended breast-summer; and to turn from column to column above the intended breast-summer, arches in sound stock-brick-work set each in Parker's cement and sand as described to the piers.

ng rubbish, g down, &c. 3274. To dig out for the foundations of the intended wing; to prepare and consolidate properly the ground for the reception of the stone footing of the walling; to fill in again and ram down the ground after the brick-work is executed, to levels agreeing

with those of the ground adjoining, and to remove the ground from under all the intended flooring to the full depth of 2 feet below the under sides of the joists.

3275. To remove and take away from the chapel, and from about the site thereof, all the superfluous ground, and all the rubbish which may from time to time result from the execution of the several intended works; and to leave finally the whole premises of the chapel entirely free therefrom.

3276. To pull down and remove all the old building of every kind at present upon the site of the intended new building.

New brick-work.

3277. To execute in a workmanlike manner, all brickwork requisite for completing the intended new wing to the chapel, including the robing-room and all the other appertenances thereof: the brick-work is to have external facings and arches to correspond with those of the other parts of the same side of the chapel; all the other parts of the brick-work are to be executed with hard well-burnt grey stock-bricks of approved quality and without any admixture of soft bricks, place-bricks, or other inferior bricks; the whole of the brick-work is to be laid in and is to be flushed entirely in mortar compounded in the proportion of one third by measure of the best fresh-burnt Dorking stone-lime, and two thirds by measure of clean Thames sand; the brick-work is also to be grouted at every alternate course with liquid mortar, care being taken not to stain the outer facings thereof: no four courses of the work are to rise more than one inch exclusive of the height of the bricks.

Chimneys.

3278. To properly turn, parget, and core the chimney of the new robing-room, and to carry up a shaft from the same to the height of 4 ft. above the parapet of the chapel, and to finish the same with salient courses and double plain tile cresting both set in and jointed with new quick Parker's cement and sand in equal measure, and to put over the flue a first-sized chimney-pot flanched round with plain tiles, the chimney-pot and tiles both set in Parker's cement and sand as the work last described.

3279. To chase out carefully the brick-work all up the side of the chapel from the intended roof-flat upwards, to the depth of 13½ ins. and for the width of 1 ft. 10½ ins., to repair and make good the brick-work round the three sides of the chase with Parker's cement and Thames sand mixed together in equal measures, and to build a complete flue and chimney-shaft to serve the pedestal-stove within the chapel, and with pargeting, coping, and chimney-pot to correspond with the other new chimney; to provide and fix wrought-iron girths, ties, bolts, nuts, and stays in weight full 224 lbs. for the security of the two chimney-shafts, the ends of the iron girths being carried through the whole thickness of the wall and secured effectually on the inside thereof by plates and washers next the inside of the chapel; to put to the robing-room fire-place a chimney-bar 2½ ins. by ⅝ in.; and to provide and fix a cast-iron funnel-pipe 12 ins. bore and full half an inch thick, with a proper bent arm and all fittings complete, in order to convey the smoke from the pedestal-stove into the brick flue: to put for the support of the slab of the vestry-room chimney a fender of

[redacted]

9-in. brick-work 2 ft. 6 ins. high, with two courses of footings one brick and a half thick.

lling, &c. 3280. To bed in mortar all the bond-timber, wood-bricks, and plates, and all other work so requiring, and to bed and point round with lime and hair mortar all the window-frames and door-frames.

ir damage, 3281. To repair in an effectual, proper, and workmanlike manner, with sound new bricks to correspond with those of the present work, and with one half by measure of the best fresh Parker's cement and one half by measure of the best clean Thames sand, all settlements and damage of every kind which may be occasioned to the brick-work by the execution of the intended works.

ns, &c. 3282. To provide sufficient 9-in. barrel-drain in order to convey the rain-water away from the cast-iron pipes to the nearest large cess-pool or public drain; and to execute all work consequent upon the formation of the said drain, and to defray and discharge all fees and other expenses incidental thereto.

nts, &c. 3283. To cut perpendicularly and parget proper indents for receiving the new brick-work where requisite.

ricks, &c. 3284. Only such of the old bricks to be taken down from the present work as remain sound and unbroken are after being well cleaned to be used again, all the other bricks to be employed in the work are to be new.

No mortar but that which is composed of Dorking lime and clean sharp Thames sand is to be used in any part of the work.

MASON. (See §§ 265—295.)

ite sill. 3285. To provide and fix upon the brick-work at the foot of the intended opening through the side wall of the chapel into the intended additional wing thereto, a continuous sill 2 ft. longer than the opening, and composed of the best Aberdeen granite parallel square curb 12 ins. by 8 ins., with all the joints therein plugged with cast-iron and run with lead, and with proper mortise-holes cut in the same for the reception of the stubs intended to be cast on the under-sides of the plate-bases of the iron columns.

3286. *This being internal work, plugs of cast-iron are given as a passable example of the use of iron, though plugs of copper would be much preferable.*

Yorkshire to founda- 3287. To provide and bed under all the walls of the intended additional building a layer of the best Yorkshire strong paving 3 ft. wide, not less than 3 ins. thick in any part thereof, with all the joints laid close, and with no stone of the same containing less than 6 ft. superficial. (*Two courses of stone would be preferable, as the least settlement of the work at the foundation would cause the new work to fracture from the old work.*)

Gang to parapet.

3288. To put all round the three external walls of the new building Portland stone throated copings 13½-ins. wide, 4 ins. thick in front, 2½-ins. thick at the back, and plugged and channeled with lead at all the joints therein; the coping is to have proper quoin-stones wrought out of solid Portland stone.

Window sills.

3289. To put to all the windows stone sills to correspond with the other window-sills of the chapel. *Note.* The sills which will be taken from the old windows may be used again as far as sound, after receiving the requisite new tooling and after being rubbed all over.

Paving.

3290. To re-lay and make good with the requisite new materials, to correspond with the present materials of the paving, all the paving of the chapel against the intended new building.

Steps, &c.

3291. To provide and fix at the robing-room external-doorway, Portland stone steps 13 ins. wide and 6½-ins. high, properly back-jointed; and to cap the piers at the ends of the same steps with Portland stone 4 ins. thick to project 2 ins. on every side over the brick-work.

Chimney-piece.

3292. To provide and fix in the robing-room a marble chimney-piece with hearth and slab value together 7*l.* exclusive of the carriage and fixing thereof.

CARPENTER. (See §§ 337—40.)

Shoring, &c.

3293. To provide, fix, alter as occasion may require, and finally remove, all shoring, struts, needles, and other proper work, materials, and appertenances requisite for the temporary support of the brick-work and other parts of the building during the cutting away of the walling and during the making good thereof.

Breast-summers, columns, &c.

3294. To provide and fix a pair of the very best Dantzic fir breast-summers, each scantling 13¾ ins. by 15 ins. and in one piece 4 ft. longer than the whole length of the intended opening from the aisle of the chapel into the new wing; the pair of breast-summers to be secured together by fourteen 1-in. bolts of wrought-iron, with proper nuts and washers; and the breast-summers are to be cambered 2 ins. in the centre. To provide and fix for the

Four columns.

support of the breast-summer, four cast-iron columns with shafts 6 ins. diameter at bottom and 5 ins. diameter at top with plate-bases 12 ins. square, 2 ins. thick, and with two stubs to each to be let into the granite sill and ornamental capitals to correspond with those of the columns supporting the galleries of the chapel.

(See §§ 567—569.)

3295. *Timber breast-summers were here adopted on account of the more easy routine of ordinary construction; but breast-summers of new timber invariably shrink, and old work left above them invariably sinks with the shrinkage of the timber: a better mode would be to insert four stone skew-backs in the old work, upon iron columns, then to cut out for and insert piecemeal three arches, and after the work is made good in cement, to remove the brick-work from under the arches. Girths of*

wrought-iron may also be set to inclose the whole of the skew-backs and arches, though if there be good abutment, this will hardly be necessary. When the use of this mode becomes common, it will be found to be as economical, as it is safe both during and after the performance of the work.

3296. To case the breast-summers and the two piers at the ends of the opening through the old side-wall of the chapel, all over with inch deal feather-tongued together, beaded at the angles, and fixed with the requisite backings.

rs. 3297. To construct the floors of the new wing with English oak plates 5 ins. by 4 ins. and Baltic fir joists 7 ins. by 2½ ins. not more than 12 ins. apart, and lay the whole thereof with 1¼-in. yellow deal listed free from sap-wood.

d-timber, &c. 3298. To put all round in the new brick-work, two complete tiers of Baltic fir bond-timber scantling 4 ins. by 2½ ins. properly lapped and spiked, and to put in the new work the requisite wood-bricks.

3299. To put all over the intended new wing-building, a flat, with wall-plate 5 ins. by 4 ins., joints not more than 12 ins. apart, each scantling 12 ins. by 2½ ins. at one end, and 14 ins. by 2½ ins. at the other end; and to prepare the same as shown by the section, with inch yellow deal boarding for lead listed free from sap-wood; and inch yellow deal riser and gutter-board laid to a current of 1½ in. in every 10 ft.; and to form over each rain-water-pipe a proper cess-pool, and to put rolls for the joints of the lead.

lery timbers fittings. 3300. To adapt and make good to the intended new works the timbers and other wood-work of the gallery-floor; and to provide and use in this part of the work at least 20 cubic feet of Baltic fir timber and at least 112 lbs. of such straps ties bolts nuts and other wrought-iron work as may be found requisite: and to make good all damage which may be done to the wood-work of the gallery.

li-linings. 3301. To put all round the intended new wing-building and round the robing-room 1¼-in. deal wall-wainscotting, with capping paneling and fittings complete; to correspond with the other wainscotting of the chapel. *Note*, that if any portion of the wainscotting which will be taken down from the aisle of the chapel should be found undecayed, the same may be applied for the new work after being properly repaired.

adows. 3302. To repair thoroughly the two wood-frames and the iron-work thereof, and to refix the same in the intended new work; and to provide and fix in all the other window-openings of the new work, new frames and iron-work to correspond in all respects with those last described: to put to each window a window-back to correspond with those of the other windows.

rs, closets, &c. 3303. To repair, adapt properly, refix, and make complete to the new robing-room, the internal vestry-door, with the linings and other finishings and fittings thereof.

3304. To provide and fix in the external door-way of the intended new robing-room, a 2½-in. deal six-panel bead-flush and square framed door, with a fir frame 6 ins. by 4 ins., with oak sill 4 ins. by 3 ins., and inch deal tongued and beaded linings, and to hang the doors with ironmongery in value 25*s*.

3305. To put across the robing-room a partition of 2-in. deal, with three four-panel 2-in. moulded and square-framed doors therein, and three 1½-in. deal moulded and square-framed closet doors above the other doors; and to fit up and hang all the doors and closets with ironmongery and fittings of the total value of ten pounds. To put round the three lower doors mouldings to form architraves.

3306. To part off the two lower closets from the lobby, and divide the three upper closets from each other by 2-in. square-framed partitions, and to put between the upper closets and the lobby and lower closets a flooring of 2-in. deal rebated and beaded and fixed with the requisite bearers complete.

Seats.

3307. To provide and fix free benches as shown by the plan and section, with 1½-in. deal seats 13 ins. wide, with rounded fronts, and with all the flap-seats hung with very strong joints: to put to all the free benches except to the flap-seats, and also next the wall, 1½-in. deal very strong framing 3 ft. high rounded at the top, and in all respects the same as new partitioning, but with the omission of the panels.

3308. To provide and fix for the security of the seats wrought-iron staunchions or stay brackets, each weight at least 20 lbs.; and to put under the seats also eighty 1½-in. deal cut brackets.

3309. To put in front of all the seats (except to the foremost seat and to the flap-seats) kneeling-boards of inch deal 6½ ins. wide, securely fixed with the requisite bearers.

To alter and make good the old seats of the chapel as may be found requisite by reason of the execution of the intended new works.

Sundries.

3310. To provide and fix all requisite centering turning-pieces fillets beads stops angle-staves furrings linings blocks templets lintels and other fittings and appertenances proper and usual in and about the carpenter's work and joiner's work of a church, and such as may be requisite for completing the new work and the old work together.

25 Cubic feet extra fir timber.

(See § 1071.)

PLASTERER.

Lath, plaster, float, set, and whiten ceilings.

3311. To lath plaster float set and whiten ceilings to the whole of the intended wing-building, including the robing-room and the lobby and closets thereto attached; and to make good in like manner the present ceilings of the chapel so far as affected or damaged by the intended works.

[redacted]

APTER XXXI.

ces. 3312. To run a plaster cornice 10 ins. girth, all round the ceilings of the wing-building, including the robing-room, and to colour the same.

elled stucco. 3313. To execute all the sides of the wing-building and of the robing-room and closets in floated troweled stucco.

To colour all the new stucco-work, except that to the robing-room, of such teint of stone colour as the architect shall direct.

als, &c. 3314. To stucco the internal window-reveals and run beads and quirks thereto to correspond with those to the other windows of the chapel.

To run all requisite other beads and quirks, and to form all requisite arrises.

irs. 3315. To repair and make good all the other plastering of the chapel wherever damaged or affected by the execution of the intended works.

ng. 3316. All the lathing is to be done with heart of fir lath-and-half laths.

PLUMBER.

milled-lead t and gutter. 3317. To lay the flat with milled-lead weight 8 lbs. to the foot superficial, turned up all round 6 ins. high against the brick-work, turned down full 4 ins. over the edge of the gutter, and with ample rolls properly lapped at all the joints thereof not more than 2 ft. 3 ins. apart.

To lay the gutter with milled-lead weight 8 lbs. to the foot superficial turned up all round at least 6 ins.

milled-lead ings. 3318. To put in the brick-work all round the flat and round the gutter, flashings of milled-lead 5 ins. wide, and weight 5 lbs. to the foot superficial.

-water-pipe. 3319. To provide and fix two complete stacks of cast-iron pipes each 3½-ins. bore, and with heads and shoes, to take the rain-water from the flat down into the drains; and to alter and make good all the rain-water pipes interfered with by the intended new building and works.

PAINTER.

rnal painting. 3320. To knot, stop, prepare properly, and paint four times with the best oil-colour, and flat extra to match the present painting of the chapel, all the new wood-work, all the new iron-work, all the stucco window-reveals, the whole of the stucco-work of the robing-room, and all the other works which usually are painted; to re-paint and make good in like manner all the painted work of the present building which may be injured by the execution of the intended new works.

Lettering.

3321. To paint in shaded Roman capital letters 2 ins. high twelve times over upon the backs of the new seats the words "Free Seats."

External painting.

3322. To prepare properly and paint four times with the best oil-colour all the external wood-work and iron-works of the intended new building; and in like manner to make good all the external painting of the works affected altered or damaged by the execution of the intended new building; the first two coats of colour upon the iron-work are to be done with red-lead paint.

Graining.

3323. To comb and grain extra in imitation of wainscot in the very best manner, and varnish twice with the best copal, the outside of the robing-room external door.

GLAZIER.

3324. To take out all the cracked and broken squares in the old windows which are intended to be used in the new buildings, and to make good the same windows with glass to match the other glass thereof.

3325. To glaze all the new windows of the intended building with the very best clear Newcastle crown glass, set in strong church lead-work and secured by strong copper bands.

3326. To clean all the windows of the new building when so directed shortly before the rendering up of the works as complete, and to leave finally perfect all the glass of the new building and all the other glass of the chapel which may be damaged by the execution of the intended works.

CHAPTER XXXII.

SPECIFICATION FOR WORKS *to be done in the erection and entire completion fit for occupation of an* INFANTS' SCHOOL *on a plot of land situate according to the Drawings of the Architect, signed with and forming part of the Contract for the execution of the work; and for digging a well, fencing in the plot of land, making up the play-ground, and for the performance of other consequent works.*

(Insert here a list of the Working-drawings. See § 986.)

GROUND-WORKMAN and BRICKLAYER.

Notice to the District-surveyor.

3327. To give to the district-surveyor the requisite notice, and pay to him his proper official fees.

APTER XXXII.

ling, &c.

3328. To prepare the whole ground-plot under the intended buildings, by levelling the earth all over the same to a regular horizontal platform, and by removing so much of the ground from under the boarded-floors as will be found requisite on account of the inclined and uneven surface of the ground over which the buildings are to stand.

3329. To dig out the ground for all the foundations, drains, cess-pools, posts, and wherever else may be requisite in order to execute and complete the design of the buildings, and the works of every kind. To render level and hard the bottoms of all the trenches, and to fill in and consolidate properly the ground about all the footings brick-work drains cess-pools and other works when executed. Note.—The ground is not to rise beneath the timber ground-floors higher than 8 ins. below the undersides of the joists.

bbish.

3330. To remove from the buildings from time to time as the same may accrue, all rubbish of every kind which will result from the execution of all the various works intended to be done; and to dispose of the same in making up the substratum of the intended walks and other gravelled surfaces; and when the gravel-work is done, to remove and cart away all remaining rubbish of every kind, and to leave finally the entire premises clear therefrom.

king up of und.

3331. To perform all ground-work requisite in order to prepare the whole surface of the plot of land lying behind the intended buildings, for a play-ground, and also for the preparation of a pathway 6 feet wide from the front fence up to the principal front entrance of the buildings, and a pathway 4 feet wide all along next the entire principal front of the buildings, and the two pathways or alleys at the ends of the buildings, all which ground-work is to be completed by consolidating the soil in a proper manner, and by altering and rendering uniform the whole thereof, spreading to form part of the sub-base the superfluous ground resulting from the digging directed by this specification to be done, and applying such other labour in and about the work as from the nature thereof may be requisite in order to render the same complete.

avel-work.

3332. To finish the entire superficial extent of the play-ground, and of all the pathways mentioned above, by providing and spreading over every part thereof, a complete stratum of the very best coarse stone ballast full 4 ins. in depth, and a complete upper stratum of the very best binding garden-gravel full 3 ins. in depth; all which gravel-work is to be beaten down and is to be rolled over and consolidated in every part thereof, and is to be left hard and perfect immediately prior to the payment of the final balance to become due to the contractor on account of the works to be performed by him.

ell.

3333. To dig, stein round with hard grey stock-bricks, and make in every respect complete in the situation shown by the drawings a well 3 ft. 6 ins. internal diameter and 30 ft. deep, and to dome over the same with 9-in. brickwork laid in mortar. *(If*

one well be required deeper an agreement should be made for each foot of the extra depth with steining complete.)

Cess-pool.

3334. To form a cess-pool in the situation shown by the drawings, 3 ft. internal diameter, 8 ft. deep, and steined round with dry stock brick-work 4 ins. thick.

Drains, &c.

3335. To construct a barrel-drain 9 ins. bore and of 4 in. brick-work as shown by the plan; and to put thereto four small shoots from the yards of the privies and from the play-ground, and to put to each drain-shoot a stench-trap and an earthen sink.

General brick-work.

3336. To execute in the very best most careful and accurate manner all brick-work requisite for carrying into effect the design of the buildings and their appertenances according to the drawings, and to render the whole premises complete and finished in every respect.

Arches.

3337. To turn arches over all the internal openings as shown by the drawings, and where otherwise may be requisite for the proper construction of the buildings, more particularly to such parts of the chimneys and of the tower as so require, in order to carry into effect and to complete properly the buildings according to the drawings.

3338. To execute according to the drawings, all the external arches in gauged-work of white bricks, cut, rubbed, and set in the closest possible manner.

(*These arches being made each with several reveals receding one behind another, did not require for their construction the long clay wedges described in* § 593.)

Windows.

3339. To form all the windows in the neatest possible manner, in brick-work as shown by the drawings, the mullions thereof to be of hard square white bricks set in Parker's cement and clean Thames sand, mixed together in equal measures, and to be pointed with mortar to match the facings; the windows are to have saddle-bars at the situations shown by the drawings, composed of wrought-iron ¼-in. by ½-in., each in one piece running through the mullions, and extending at each end 6 ins. into the jamb; the mullions and arches are also to have grooves cut out all round ¼-in. square, in order to receive the glazing. To cement all round all the leaded lights when fixed by the glazier.

Facings. (See §§ 358—60, & 867.)

3340. To face with the very best square white bricks of uniform colour, jointed in the neatest possible manner, every part of the external brick-work of the whole of the buildings of every kind, including all the returns, jambs, reveals, and other appertenances thereof.

Parapets, gables, &c.

3341. To finish the parapet on the four sides of the tower in the manner shown by the drawings, with chamfered heading-bricks to form a corbeille-cornice; and to finish the gable as shown by the drawings with the brick-work set over step-wise.

Chimneys.

3342. To properly turn, parget, and core all the flues; to

put to the fire-places of the school-room and kitchen wrought-iron chimney-bars ½ in. by 2½ ins.; and to put to each of the other fire-places wrought-iron chimney-bars ⅜ in. by 2 ins.: the chimneys are to be arched over so as to ascend in the most gentle manner possible, and issue with octagonal turret-shafts 13½ ins. internal diameter at the four angles of the tower: to put for the support of the slabs of the fire-places to the school-room and the living-room brick fenders 4 ins. thick and 12 ins. high; and to put to the fire-place of the chamber a 4-in. brick-trimmer 12 ins. longer than the chimney-opening.

Ventilators, air-flues, and openings.

3343. To form round the walls in the situations shown by the drawings air-flues with openings to ventilate the ground-floors and the school-room, and to provide bed and fix to the upper air-flues No. 15 cast-iron valves, and No. 13 cast-iron gothic ornamental gratings according to the drawings.

Bedding, &c.

3344. To bed in mortar all the bond-timber, plates, lintels, wood-bricks, templets, and other timbers and work so requiring; to bed and point round with lime and hair mortar all the door-frames and window-frames; and to back up with solid brick-work to all the timbers, stone-work, and other things to be set in the brick-work.

Splays, &c.

3345. To cut and rub in the neatest and most workmanlike manner, splays wherever shown by the drawings to the angles of the buttresses, plinths, window-jambs, window-mullions, door-jambs, the quoins and other parts of the buildings; and to finish the splays with moulded heads in brick-work where the same are not intended to be finished with stone.

Brick piers, &c.

3346. To build for the support of the sleepers to the ground-floors brick-piers 9 ins. by 4 ins. two courses high and not more than 3 ft. apart, and to build under the stair-case-partition a 4-in. cross-wall 3 courses high.

Brick-paving.

3347. To pave with hard square white bricks laid flat in mortar and grouted with mortar between the joints, the whole of the entrance-porch, the scullery or kitchen, and the room for cloaks, and the two yards to the privies; the paving of the lobby is to be laid in manner of herring-bone.

Filleting to roofs.

3348. To form round all the roofs which gable or otherwise abut against brick-work, filleting by setting the bricks in as neat a manner as possible to jet out 1½ in. over the slating, and to fill in between the brick filleting and the slating with good Parker's cement.

One rod extra brick-work.

(See § 1007.)

Bricks.

(See § 1008.)

Mortar.

(See § 1009.)

Mode of doing the work.

(See § 1010.)

Lime-whiting.

3349. To finish completely fairly, and to lime-whiten twice

every part of the interior work of the school-room, of the scullery, of the entrance-porch, of the stair-case, and of all the closets and privies.

Scaffolding.

3350. To provide, maintain, alter as occasion may require, and finally remove all scaffolding requisite for the performance of the whole of the works of every kind of the intended buildings and of their appertenances, with sufficient poles, cords, ropes, wedges, planks, ladders, tackle, and all other proper things necessary thereto.

MASON. (See §§ 265—95.)

Fifteen heads to the chamfers of the buttresses.

3351. To finish the head of each of the chamferings to the buttresses with a piece of Portland stone 6 ins. long, 4½ ins. wide, and 3 ins. high, wrought fairly and with a moulded angle, as shown by the drawings.

Fourteen water-tables to buttresses.

3352. To put to each of the buttresses moulded water-tabling as shown by the drawings; each water-table is to be wrought out of a piece of Portland stone 18 ins. wide on the face, 12 ins. broad on the bed, and 15 ins. high: the water-table to be placed where the front of the tower unites with the body of the school-room, is to be wrought out of the solid to mitre properly.

Eight gable-headed water-tables to buttresses of tower.

3353. To finish the eight buttresses of the tower with gable-headed water-tables wrought as shown by the drawings, each out of a piece of Portland stone 2 ft. wide and 1 ft. 4 ins. deep on the bed and 2 ft. high.

Water-tables and finial over entrance to porch.

3354. To finish the principal external entrance to the porch in the manner shown by the drawing, with Portland stone water-tables and a finial each 9 ins. wide on the bed and of the several heights and lengths shown by the drawings.

String-course.

3355. To put the string-course as shown by the drawings, composed of Portland stone 4 ins. by 7 ins., moulded, mitred, and run with lead at all the joints therein.

Tablet and label-moulding.

3356. To put over the principal entrance of the porch a tablet of rubbed Castle-hill stone 3 ft. long, 2 ft. 6 ins. high, and 2½ ins. thick secured by four strong copper cramps each 10 ins. long turned into the brickwork.

To put over the tablet a label moulding of Portland stone 4 ins. by 7 ins. wrought and mitred as shown by the drawings.

Water-tabling of battlements.

3357. To cope the battlements and embrasures of the whole parapet round the tower with water-tabling, without joints, wrought according to the drawings, and composed of Portland stone 6 ins. high and 13 ins. wide on the bed.

Four heads of chimney-turrets.

3358. To finish the heads of the four chimney-turrets, each with a piece of Portland stone 9 ins. high, moulded and wrought in the manner of small battlements as shown by the drawings, and with a hole cut through the stone for the flue.

CHAPTER XXXII.

20 feet superficial Yorkshire stone for chimneys, &c.

3359. To provide and fix 20 feet superficial of 3-in. Yorkshire stone for turning over the chimneys and for such other purposes as may be by the architect directed.

Window-sills.

3360. To put to all the windows, sills of 1½-in. Castle-hill stone, wrought fair on the edges and laid sloping in the manner shown by the drawings; the different tablings of the sills are to be formed by lapping one piece of stone over another.

Steps.

3361. To put to each of the five external door-ways of the buildings a solid Yorkshire stone step 7 ins. by 12 ins. properly back-jointed.

Sink.

3362. To provide and fix in the scullery or kitchen a 6-in. Yorkshire stone sink 2 ft. 6 ins. long and 2 ft. wide cut out in order to receive the pipe and grating.

Chimney-pieces, &c.

3363. To put to the fire-places of the living-room and chamber, jambs mantles and shelves of Portland stone each 1¼-in. thick and 5 ins. wide.

To put to each of the fire-places except that to the kitchen or scullery, a slab of rubbed Yorkshire stone full 2½-ins. thick, 12 ins. longer than the opening and 18 ins. wide; and to put to each of the same 3 fire-places a hearth of 2½-in. rough Yorkshire stone.

SLATER. (See §§ 542—3.)

Dutchess slating.

3364. To slate the whole of the principal roof over the school-room with the very best strong dutchess slates.

Countess slating.

3365. To slate the whole of the remainder of the roofs of the intended buildings with the very best strong countess slates.

Nails, bond, &c.

3366. The whole of the slating is to be fixed with strong copper nails, and is to have proper bond in every part thereof, particularly at the heading courses, with cut slates instead of as in the more usual mode slates laid lengthwise with narrow slips of slate between them.

Reparation.

(See § 1025.)

CARPENTER AND JOINER. (See §§ 337—40.)

New materials, &c.

3367. To provide sufficient new materials for and frame fix and finish all carpenter's work and joiner's work (complete with all proper ironmongery of the very best quality) which may be requisite for carrying into effect and for finishing in every respect the school and its appertenances according to the design.

Timber and deal.

(See §§ 1031—2.)

Sundries.

3368. The rafters over the school-room are not to be more than 12 ins. from the centre of one rafter to the centre of the

next rafter; none of the joists ceiling-joists and the other rafters are to be more than 12 ins. apart.

To provide and fix all requisite shores, struts, puncheons, oak wedges, ties, cletes, beads, stops, fillets, tilting-fillets, backings, blocks, linings, casings, furrings, and rolls, and all moulds rods and patterns requisite for setting out and executing accurately all the various works: to provide 168 lbs. avoirdupoise of wrought-iron in such straps ties and bolts as may be directed in addition to the iron-work elsewhere herein described; and to fix all the iron-work. To perform such rebating, grooving, tonguing, beading, scribing, chamfering, housing, jointing, mortising, framing, dove-tailing, plaining, and other work and labour as may be found requisite for the perfect performance of and the thorough completion of the whole of the buildings and the fittings and appertenances thereof.

Centering.

3369. To provide, fix, ease when so directed, and finally remove, all centering and turning pieces requisite for the trimmers and arches of every kind.

Casing to stone-work.

3370. To case up all the stone-work and the angles of the brick-work in manner sufficient to preserve the same from injury during the carrying on of the works of the buildings.

Bond timber, &c.

3371. To put all round in the brick-work of each story of all the buildings one complete tier of fir bond-timber scantling 4 ins. by 2½ ins.; and to put in the brick-work all round the school-room a second tier of similar bond-timber: the whole of the bond-timber is to be in as long pieces as possible, and is to be properly lapped scarfed and spiked at all the joins thereof.

To put all wood-bricks requisite for receiving the ends of the templets and such finishings of the buildings as may so require.

Lintels. (See § 1041.)

3372. To put over the folding-doors from the school-room to the living-room, a fir lintel 5 ft. 9 ins. long, 6 ins. high, and 13½ ins. wide: to put over the window of the scullery or kitchen a fir wrought and chamfered lintel 4 ft. long and scantling 4 ins. by 4 ins., and to put over the back door of the scullery a similar lintel 3 ft. 6 ins. long.

Ground-floors.

3373. To construct the floors to the school-room to the living-room and to the closets thereto attached, with fir joists 2¼ ins. by 3½ ins. upon oak sleepers 4 ins. by 2½ ins.; and to lay the whole of the joists with 1¼ in. yellow deal listed free from sap-wood, the boarded flooring of the living-room being wrought all over.

One-pair floor.

3374. To construct the one-pair floor within the tower, with wall-plate 4 ins. by 3 ins., joists 8 ins. by 2¼ ins., and trimmers and trimming-joists 8 ins. by 2¾ ins., and to lay the whole flooring with inch white deal wrought.

Roof over the school-room.

3375.

	Ins.	Ins.
Wall-plate all round...	4 by	4
2 angle-ties each 4 ft. long	4 —	2½
4 tie-beams	8 —	3
8 principals ... at top 4 ins. by 3 ins., at bottom	5 —	3

[redacted]

APTER XXXII.

		Ins.	Ins.
	4 king-po ts	7	— 3
	8 struts	3	— 2
	Rafters in one length without scarfing, laid horizontally to serve as slate-battens, the ends thereof being shaped externally over the principal gable. (See §§ 513—16.)	3	— 2
	All requisite tilting fillets.		
	4 stirrups to the king-posts turned up out of wrought-iron ¼ in. by 1½-in., and 3 ft. 3 ins. long, with two wrought-iron ½ in. bolts with nuts and washers and with keyed wedges to each.		
	8 stays to the feet of the principals turned up each out of wrought-iron ¼ in. by 1¼-in. with a wrought-iron ½ in. bolt with nut and washer to each.		
'over the r.	3376. Wall-plate	4 by	3
	A pair of gutter-plates (each)	9	— 2½
	Rafters	4	— 2
	4 angle-ties each 3 ft. 6 ins. long	3	— 2
	2 binders each 6 ft. long	4	— 2½
	Ceiling-joists spiked in one length diagonally across the whole ceiling	2	— 2½
	Slate-battens	2	— ¾
	All requisite tilting fillets.		
	A dormer with the sides and the top thereof battened for slating on rafters 3 ins. by 2 ins., plate and frame 3 ins. by 3 ins., ¼ in. ledged door and inner trap-door with bolts hinges and fittings complete.		
	Inch yellow deal gutter-board laid on framed bearers to current 1½-in. to 10 feet.		
›ver the :y or kit- and the 'or cloaks.	3377. Wall-plates all round	4 by	2½
	4 angle-ties each 2 ft. 9 ins. long	3	— 2
	Ridge and hip	6	— 1
	Rafters	2½	— 2
	Slate-battens	2	— ¾
	All requisite tilting-fillets.		
y on the l story.	3378. To construct the gallery in the school-room as shown by the drawings, with joists 7 ins. by 2 ins. bracketed with 1½-in. gusset-pieces, laid with 1¼-in. yellow deal wrought, and with inch yellow deal risers; to inclose the end next the passage with 1¼-in. deal spandril square framing raking 2 ft. high above the seats, finished with beaded capping on the top, and to put in the same partition an 1¼-in. square framed door hung with hinges, a bolt and stops complete.		
ıg.	3379. To skirt the living-room and the chamber with ¾-in. yellow deal 4 ins. high, plugged to the walls.		
-staves.	3380. To put to the chimney-front of the chamber proper rebated angle staves.		
ions.	3381. To inclose the stair-case and all the closets with 2-in. deal square framed partitions with ¾-in. deal panels not more than		

10 ins. wide, and to put round all the doorways therein, beaded and chamfered door-stops.

Gothic windows.

3382. To fit up the window of the living-room with a solid fir proper frame 5 ins. by 4 ins. with an oak sunk and weathered sill 4 ins. by 3 ins., and to put thereto 2-in. chamfered-bar sashes with a pair of French casements, hung to open outwardly with 2 pairs of 3-in. butt-hinges and with other ironmongery value 10*s.* and with all requisite beads, stops, and grounds.

3383. To fit up the window of the chamber with a solid fir wrought and chamfered frame 5 ins. by 4 ins. with oak wrought sunk and weathered sill 4 ins. by 3 ins. and a chamfered-bar casement hung vertically on centres and made complete with beads, stops, and fastenings.

To put to the window of the scullery a deal cased-frame with oak sunk sill and 1½-in. chamfered-bar sashes double-hung with patent lines, iron axle-pulleys, iron weights, and a patent spring-fastening.

Doors.

3384. To put to the living-room, to the chamber, to the school-room, and to the room for cloaks, five 1½-in. four-panel square-framed doors hung each with a pair of 3-in. butt-hinges and with other ironmongery to each value 10*s.* including the fixing.

To put to the opening from the school-room to the living-room a pair of 2-in. square framed folding-doors as shown by the drawings, hung with three pairs of 3½-in. butt-hinges, and with other ironmongery value 20*s.* including the fixing thereof.

To put to each of the closets a four-panel 1¼-in. square framed door hung with a pair of 3-in. butt-hinges and with other ironmongery value 5*s.* including the fixing thereof.

To put to the scullery or kitchen two ¾-in. wrought, ploughed, tongued, beaded, and ledged doors, hung each with a pair of 18-in. cross garnet hinges, two 9-in. rough rod bolts, and a Norfolk thumb latch.

To put to the two external doorways of the school-room 2-in. deal bead-flush and square framed sashed-doors according to the drawings, hung each with a pair of 3½-in. butt-hinges, two 9-in. rough rod bolts, and a Norfolk thumb latch.

Door-cases, linings, &c.

3385. To put to the four single doors of the school-room and the two doors of the scullery or kitchen, fir wrought framed and chamfered door-cases 5 ins. by 4 ins. tenoned at bottom with a piece of 4 lb. milled-lead 16 ins. square, wrapped round the foot of each external door-post, and nailed at the top thereof with copper nails, the two external door-cases of the school-room to have wrought framed and chamfered transoms and 1½ in. yellow deal fan-lights hung vertically upon centres and fitted up properly with mitred beads on both sides.

To put to the folding-doors between the school-room and the living-room 1¼ in. square framed single rebated and chamfered jamb-linings and soffit, framed in seven panels to match the doors.

Stair-case.

3386. To construct the stair-case as shown by the drawings, with 1¼-in. yellow deal, wrought treads and risers, housed into 1½-in. yellow deal string-boards, framed and turned newels 3½ ins.

by 3½ ins., bar-balusters 1⅛ in. square, deal moulded hand-rail with mitred cap, ⅞ in. deal apron-linings, and all requisite blocks and other fittings.

ls. 3387. To put in the closets 50 feet superficial of inch deal shelfing, fixed in proper bearers.

es. 3388. To fit up the three privies according to the drawings, with one tier of bond timber 4¼ ins. by 2½ ins., wall-plates 4¼ ins. by 2½ ins., rafters 3 ins. by 2 ins., ridge 1 in. by 4½ ins., slate-battens ¾ in. by 2 ins., five fir proper door-cases 4½ ins. by 4½ ins., three doors of ¾ in. deal, wrought, ploughed, tongued, beaded and ledged, and hung with strong hinges, and with other ironmongery value 20*s.*, floors of inch yellow deal upon fir bearers 4 ins. by 2 ins., inch deal seats and risers, with proper fittings and bearers.

To put round the tops of the walls inclosing the yards of the privies, an oak plate 6 ins. wide, and cut 3 ins. thick in front, and 2 ins. thick at back.

ty feet cube fir. (See § 1071.)

s, &c. 3389. To inclose the West-side of the ground from the front to the kitchen or scullery, and from thence quite back to the North-west corner of the ground, by an oak cleft fence 4 ft. 6 ins. high, securely fixed to two arris-rails cut diagonally out of fir 4 ins. by 3 ins., and framed into oak posts, not more than 8 feet apart, pitched at the bottom, scantling 4½ ins. by 3½ ins., length 7 ft. 6 ins., and each post secured by two spurs of oak pitched all over, scantling 3 ins. by 3 ins., and 4 ft. long.

To put to the front of the ground a gate 3 ft. wide, to correspond with the oak cleft fence, ledged and braced at the back, fitted up and hung with strong hinges, a latch, and other fittings complete, to two oak posts with two oak spurs similar to the posts and spurs described to the intended new fence.

ng-work. (See § 1070.)

PLASTERER.

plaster, set, hiten. 3390. To lath, plaster, set and whiten ceilings to the living-room, to the entrance-porch, and to the whole of the one-pair story.

r, set, and 3391. To render, set, and colour the internal brick-work of the living-room, and of the chamber.

s, &c. 3392. To run and execute all requisite beads, and quirks, and form all necessary arrises.

PLUMBER.

3393. To provide and fix in the scullery or kitchen, with all proper apparatus and appertenances complete, one of Turner's

3 in. iron-pumps, with strong lead suction-pipe, suitable for a well 28 ft. deep.

Hips and ridges.

3394. To cover the hips and ridges of the buildings, with 4 lb. milled-lead 16 ins. wide, properly secured by copper nails.

Gutter.

3395. To lay the gutter of the tower with milled-lead, weight 6 lbs. to the foot superficial, turned up 12 ins. at each side.

Rain-water-pipes.

3396. To provide and fix four complete stacks of cast-iron rain-water-pipes, each 3½ ins. bore, extending from the guttering, and with heads and shoes complete.

Eaves'-guttering.

To provide and fix at all the projecting eaves 4 in. cast-iron eaves'-guttering, securely fixed upon strong wrought-iron brackets, and put together with white lead.

Dormer.

3397. To put all round the four sides of the dormer, flashings of 4 lb. milled lead, 12 ins. average width.

Waste pipe, &c., to sink.

3398. To put to the sink a strong lead, 2-in. waste-pipe, and a bell grating.

PAINTER.

Four times in oil to iron-work.

3399. To paint four times with the best oil-colour, the whole of the iron-work of the intended buildings, the first two coats of colour being red-lead paint, and the last coat of paint being stone colour.

Four times in oil.

3400. To knot, stop, prepare properly, and paint four times with the best oil-colour, the whole of the wood-works of the intended buildings.

GLAZIER.

Second-glass in sashes, &c.

3401. To glaze all the wood-sashes, the fan-lights, and the sashed-doors with good second Newcastle crown-glass properly bedded, bradded, and back-puttied.

Leaded-lights.

3402. To glaze all the other windows in the manner shown by the drawings, with small squares set in strong church-window lead, and with sufficient copper bands to secure the same to the saddle-bars.

Casements.

3403. To put to each of the five front windows of the school-room, a wrought-iron casement, the whole size of one compartment of each window, the arched heads excepted, and with saddle-bars, joints, fastenings, and lines complete.

Cleaning, &c.

3404. To clean, repair, and leave perfect, all the glazing of the buildings, at the final rendering up of the same as complete.

CHAPTER XXXIII.

A SPECIFICATION *of the several works to be done in erecting and completely finishing the building of a new* NATIONAL SCHOOL-HOUSE *at* , *agreeably to the drawings hereunder enumerated, and according to such further explanatory drawings and directions as by the architect or surveyor for the time being may be given.*

List of Working-drawings. (See § 986.)

No. 1. Plan of the foundations.
2. do. first story.
3. do. second story.
4. do. attic of the dwelling.
5. do. roofs.
6. Northern elevation.
7. Western do.
8. Southern do.
9. Eastern do.
10. Section from North to South.
11. Do. from C to D on the Plans.
12. Do. from E to F on do.
13. Do. from G to H on do.
14, &c. Sections of the mouldings, &c.

BRICKLAYER.

To make complete the wall of the adjoining house.

3405. To cut out all the perished portions of the North external wall of the adjoining dwelling-house on the South side of the premises, and to bond into the same and carry up therewith in the most careful manner new brick-work upon the two sets-off in order to make the face of the wall next the intended new buildings as nearly perpendicular as possible; to repair, rake out from the same the mortar full one inch deep and flat-joint-point entirely in a workmanlike manner the lower part of the wall beneath the first set-off, and to make the whole of the wall complete in every respect, and to put on the top thereof new brick-on-edge and double plain tile cresting the same as hereafter described.

Notice to district-surveyor, &c.

3406. To give to the District-surveyor, to the surveyor of pavements, and to the other public officers, the requisite notices of every kind, and pay to them their respective proper official fees and charges.

To take down burial-ground walls.

3407. To take down and remove the whole of the burial-ground walls with the entire foundations thereof from the North and West sides of the site of the intended new buildings, with the exception of that portion of the wall on the North side of the intended building which will lie against the great stair-case.

Disposal of the present new bricks.

3408. To use in the foundations of the intended buildings the whole of the new bricks now in the West wall lately built next the new burial-ground, except such portion thereof as may become destroyed in the taking down and removal of the same.

Old bricks.

3409. To select carefully from the materials of the old wall, intended to be removed from the North side of the buildings, such of the bricks therein as may be found to remain not less in length than 4 ins., and of the quality and hardness of stock-bricks; to stack up in 9 in. walls so as to be readily inspected, all such bricks so selected to be used when and where only as the surveyor shall direct; and to cart away immediately, and before any of the new brick-work is commenced, all the remainder of the materials of the said wall.

Shore ground.

3410. To shore and strut the ground about the buildings while the foundation-works thereof are being carried on; and to bale out or pump away all water which may come into or upon the foundations from springs currents drains rain or otherwise.

Bale out water.

Digging and cartage.

3411. To dig out wherever requisite for the foundations and works generally, and to make up the ground in manner shown by the sections or other drawings; and to cart away entirely all earth soil and other matters which will of necessity require removal in order to leave the ground and soil at the levels shown by the drawings.

Filling in of ground. (See § 3221.)

3412. To fill in the ground about the foundations when so directed by the architect; all the ground within the intended new buildings is to be rammed in close, water being poured in from time to time in order to consolidate the same: all the bones disturbed from the burial-grounds are to be re-interred therein, and the foundations are to be filled in and the burial-grounds are to be made up to their present levels with fine earth screened into the same.

Rubbish, &c. (See §§ 959 and 3330.)

3413. To remove and cart away from the premises all rubbish and other useless matters which may from time to time accrue in and about the premises from the performance of the various works of the buildings.

Indents in adjoining premises.

3414. To cut and parget perpendicular indents at the angle of the house adjoining to the principal front of the building and wherever else may be requisite for the insertion of the new work.

Repair adjoining brick-work.

3415. To repair the brick-work of the adjoining premises wherever the same may be in any manner injured or affected by the execution of the intended new erections, more particularly at the ends of the principal front of the school building.

General brick-work.

3416. To execute all brick-work requisite for carrying into effect the design of the buildings according to the drawings and directions of the architect.

Rough arches.

3417. To turn arches and counter-arches wherever the same can be put: those over the recesses on the East side of the one-pair story of the building are to be turned throughout the whole thickness of the wall, and the brick-work of the backs of the

recesses is to be filled in up to the soffits of the arches after the centerings are struck.

Chimneys, &c.

3418. To properly turn parget and core all the flues: to put to each of the fire-places on the ground-story, a brick fender 9 ins. thick and 15 ins. high in order to support the chimney-slab; and to put to each of the other fire-places a 4 in. brick trimmer 18 ins. longer than the chimney-opening.

Chimney-shafts.

3419. The chimney-shafts are to be set diagonally in distinct pairs according to the drawings, with salient-courses and block headers cut and rubbed, and to be finished on the top with a course of bricks cut hollow and rubbed to the shape shown by the drawings, and set in Parker's cement and Thames sand mixed together in equal measures.

Piers under ground-floor.

3420. To put under the sleepers of the ground-flooring brick piers as shown by the drawings; each pier is to be in two courses 9 ins. by 4 ins. with a foundation 9 ins. by 13½ ins. and one course high.

Bedding, &c.

3421. To bed and point round with lime and hair mortar all the window-frames and door-frames intended to be set in the brick-work, and to bed in mortar all the bond-timber, plates, wood-bricks, templets, and the other work and materials which are to be inserted in the brick-work.

Brick-nogging.

3422. To brick-nog the whole of the partitions and inclosures of the privies, and to brick-nog also the cross partition between the two school-rooms on the lower story.

Gauged arches.

3423. To put to all the openings of the Eastern, Western, and Northern fronts of the building, gauged arches of the respective widths and dimensions shown by the drawings, properly cut and set, and with their soffits and backs perfectly close and without being broken away in the ordinary manner.

Tile cresting, &c.

3424. To finish such of the walls as have not stone copings with brick-on-edge and double plain tile cresting both set in and jointed with new quick Parker's cement, and Thames sand mixed together in equal measures.

Splays.

3425. To cut in a perfect manner all the splays round the openings and recesses as shown by the drawings. All the external splays are to be rubbed quite smooth.

Facings.

3426. The whole of the external parts of the brick-work are to be faced with picked stocks of a bright and uniform colour finished with neat joints properly drawn.

Plinth.

3427. The top of the plinth round the building is to be composed of bricks cut or moulded to the profile of the section.

Funnels to privies, &c.

3428. To form in the brick-work to each privy an air-funnel with an internal orifice beneath the privy-seat, and with an upper external orifice above the guttering, so formed as that wet shall not beat into the same.

16 in. barrel-drain.

3429. To build a barrel-drain 16 ins. diameter inside, as shown by the plan of the foundations: the sides of the drain are to be 4 ins. thick, and the lower half of the drain is to be stuccoed with pure quick Parker's cement ½ in. thick; and in addition thereto to continue a similar drain from the entrance of the building to the common sewer, being paid for such additional length the sum of for every foot run thereof, including stuccoing the inside with cement, and also all expense of digging and of relaying and making good the pavings.

Drains, &c. from rain-water-pipes. (See § 1104.)

3430. To put from the rain-water-pipes to the barrel-drain, additional drains of 6-in. barrel-drain tiles as shown by the plan of the foundations, and to put a funnel set in new quick Parker's cement to lead from each rain-water-pipe down into the same.

Funnels in yard.

3431. To put to each of the three yards a funnel to lead from the gratings down into the barrel-drain with a large stench-trap in each.

Fill in between plates.

3432. To fill in solidly with brick-work between the plates of the various roofs.

Lime-whiting.

3433. To joint smoothly and evenly and lime-whiten twice the whole of the internal brick-work of the building of every kind, except that of the committee-room and of the dwelling; to lime-whiten twice also the inside of the roof over the boys' school, and all the rough timbering of the buildings.

Cement round boys' yard.

3434. To stucco with pure quick Parker's cement 4 ft. high and ¾ in. thick round the walls of the boys' yard.

Bricks.

3435. All the bricks except those which are already on the premises are to be new, approved, hard-burnt, square, grey stock-bricks free from soft bricks, place-bricks, or other inferior bricks.

Mortar.

(See § 1009.)

Mode of doing the work.

(See §§ 353—65, and 1010.)

Reparation of accidents, &c. (See § 1111.)

3436. All the walls are to be built level and perpendicular, except where otherwise directed; and should any damage occur thereto by accident settlement or otherwise within twelve months from the time of the completion of the building, the contractor is to make the same good as shall be by the surveyor directed.

Jobbing work.

(See § 1011.)

[redacted]

APTER XXXIII.

MASON. (See §§ 265—295.)

tables to ises.

3437. To put to each buttress, two water-tables of Portland stone moulded according to the drawings; each of the lower water-tables is to be 18 ins. long, 9 ins. broad, and 9 ins. high; and each of the upper water-tables is to be 18 ins. long, 12 ins. broad, and 15 ins. high.

lds.

3438. To provide and fix the two shields at the northern end of the school, each of Portland stone 5 ins. thick and each fixed with three 9 in. copper cramps.

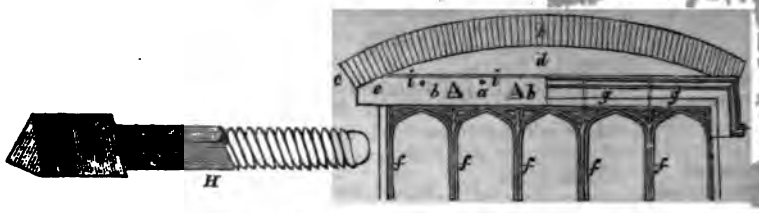
3439. To put in the principal front of the building a tablet of Portland stone 5 ins. thick secured by four 9-in. copper cramps; and to cut thereon an inscription as shall be directed.

3440. To provide and fix the label-mouldings or cornices over the windows and inscription-stone according to the drawings, of Portland stone scantling 7 ins. by 4 ins. with joints therein only where shown by blue marks, plugged with lead and with proper returned mitres. *Note*, that the label over the great north window is to be one inch higher than the others, in order to suit the moulding of the large water-tables with which it is to range.

3441. As in the construction of modern imitations of declined gothic architecture, a difficulty frequently presents itself in the endeavour to relieve from superincumbent weight, the mullions and flat heads of very large windows, some few words upon this subject may not be accounted amiss.

If the mullions be of stone, they may be made to bear the several portions of the window-head which will lie above them, but the stones composing the mullions and heads should be omitted at first, and not be fixed till the main work has settled, a *discharging-arch* being turned over the whole aperture in order to support the superincumbent work, and to relieve from weight the mullions and window-head. Casting weight upon these will be sure to derange them, as may be seen in the great west window of St. George's chapel, at Windsor, which was built after decline in the structure of gothic architecture had made considerable advances; and at the new St. Katharine's Hospital, Marylebone, fracture has occurred from superincumbent weight, even in small windows, not only in the lintel-stones, but even the heads of the mullions have split where two lintel-stones have been united above them, and have acted with differing pressures.

In meaner buildings, composed principally of brick-work with window-cases of wood, (and in the one now under description,) the author has successfully adopted the expedients hereunder described.



a Strong lintel or breast-summer of timber, covered all over with 4 lb. sheet-lead to preserve it from rotting by reason of the humidity communicated by the stone-work placed in front of it.

b Discharging-arch turned over the timber lintel or breast-summer.

c Skew-back of the arch placed beyond the end of the timber, so that the superincumbent brick-work shall not settle down though the timber should shrink.

d Open space between the timber and the arch, not to be filled up till after the work has fully subsided, and then only with very thin work sufficient to keep out the weather.

e End of the timber cut away quite freely from under the arch, so as to allow the rise of the arch to be considerable without the opening being much.

f The window-frame of wood.

g Window-head and label-moulding of t n stone (4 or 5 ins. thick in the thinnest part) placed before the timber lintel or breast-summer, with a joint over every mullion of the wood frame.

h Wedge-shaped skew-backs of copper, inserted quite through the timber lintel or breast-summer, with square stems so as not to turn, and with washers and nuts screwed on the inside of the building, and forming concealed arch-joints in the stone-work.

***H* Enlarged view of** one of the concealed copper skew-backs.

i Bolts of copper with dove-tailed heads cast with lead into the back of each stone of the window-heads, and inserted quite through the timber lintel, and with washers and nuts screwed on the inside of the building, in order to prevent the stones from becoming detached from the timber: there may be two of these bolts to each stone.

The breast-summer may be made of cast-iron, though in ***superior*** **buildings the complete Pointed Style of architecture** should be preferred.

3442. To put beneath the label-mouldings where there are not gauged arches, Portland stone window-heads 9 ins. thick, chamfered as the jambs, and 9 ins. longer than the opening.

Water-tables to towers.

3443. To put to the five towers, Portland stone moulded water-tables, according to the drawings, scantling 15 ins. high, and 12 ins. bed: the joints thereof to be placed only where shown by the blue lines, and to be plugged with lead.

Cornices or strings.

3444. To put cornices or strings according to the drawings in all respects as the label-mouldings above described.

Battlements and copings.

3445. To cope the whole of the walls, gables, and battlements of the Eastern, Southern, Northern, and Western elevations, and all the returns thereof, with Portland stone, wrought and moulded according to the drawings, and throated at the back; scantling 12 ins. bed, and 7½ ins. height: the copings to the battlements, and to the embrasures between the same, are to be each in one stone: all the other copings are to be in lengths as long as possible, and are to be plugged with lead at all the joints thereof.

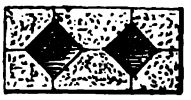
Note. That where the chimneys saddle upon the gables, the copings may be of height less than above described, in order to form proper seats for the brick-work.

Water-tables, &c to chimneys.

3446. To put at the foot of each of the three stacks of chimneys above the gables, a water-table of Portland stone 5 ft. 4 ins. long, 2 ft. 7 ins. wide, and 12 ins. thick, sunk out, wrought, and throated, according to the drawings.

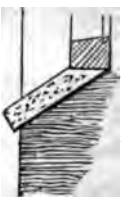
[redacted]

APTER XXXIII.



Note.—That each water-table may be in 6 pieces as shown by the margin. To put four corbeilles of 4-in. Yorkshire stone each 12 ins. by 1 ft. 10 ins. to support the corners of the chimney-stacks behind the gables.

ow-sills. mittee-room welling.



3447. To put to the four windows of the committee-room and of the dwelling, sills of 3 in. Yorkshire paving, 10 ins. wide, laid sloping, wrought fairly in front, and with tooled soffit ends, and level tops beneath the sash sills.

r school ows and windows.

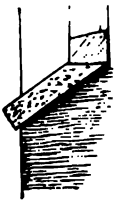
3448. To put to all the lower windows of the school-building, and to the openings in the three gables thereof, sills of 3-in. rubbed Yorkshire stone 13 ins. wide, laid sloping, wrought with beviled fair edges in front, and with tooled ends, and with level top beneath the sash sill.

North ow.

3449. To put to the large North window, a double water-table of Portland stone 1 ft. 6 ins. high, wrought, throated, and plugged with lead.

Note. That the water-table is to be in seven pieces, and the upper and lower parts may be cut from each other diagonally from stone 9 ins. by 9 ins.

sills.



3450. To put to all the other windows, sills of 3 in. Yorkshire stone 18 ins. wide, laid sloping, wrought fairly in front, and with tooled soffit ends and level top beneath the sash sills.

hire paving.

3451. To pave with 2½ in. Yorkshire stone paving, in regular courses 2 ft. wide, and with the joints thereof wrought smoothly through the whole thickness of the stone, the whole of the three yards, all the privies, and every part of the lower story of the building, except the school-rooms and the passage between the school-rooms.

for gate.

3452. To put in the piers of the entrance, two pieces of Portland stone 1 ft. 6 ins. wide, 9 ins. high, and 2 ft. long, cut out to receive the iron-work, and moulded to the plan of the piers.

3453. To construct the six steps, leading from the entrance lobby up to the stair-case, of 3 in. Yorkshire stone paving, with treads 12 ins. wide, with tooled edges, and risers 3 ins. wide also with tooled edges; to put at the external-entrance three steps of

solid Yorkshire stone, properly jointed, run with lead, and back-jointed.

Sinks.

3454. To put in the paving of each of the three yards, a five-hole sink-stone, and to put in the boys' yard an urine-sink of Yorkshire stone 12 ins. wide, and 4 ft. 6 ins. long, with bearers complete: each sink-stone is to be sunk out of a piece of stone 4 ins. thick.

Corbeilles. (See § 1267.)

3455. To put corbeilles of 6 in. Yorkstone stone landing, properly wrought to support the chimney-jambs of the dwelling.

Hearths.

3456. To put to the fire-place of the committee-room a hearth of rubbed 2-in. Yorkshire stone; and to put to all the other fire-places hearths of rough 2½-in. Yorkshire stone.

Slabs.

3457. To put to the four fire-places of the school-rooms slabs of rubbed 2½-in. Yorkshire stone each 5 ft. long and 2 ft. wide.

To put to all the other fire-places slabs of 2 in. Portland stone each 1 ft. 6 ins. wide and 18 ins. longer than the chimney-opening.

Chimney-pieces.

3458. To put to the four fire-places of the committee-room and dwelling, 1½-in. Portland stone chimney-piece with jambs 5½ ins. wide chamfered on the edges, shelves 6 ins. wide, and mantles 7½ ins. wide cut out 2 ins. to the figure of a Gothic arch, and chamfered on the edge.

Repair public paving.

3459. To make good all the public paving which will be disturbed or damaged by or in consequence of the execution of the intended works, or to pay to the Commissioners of Paving the expense of so doing.

Mortise-holes, &c.

3460. To cut mortise-holes for the iron-gratings and for the ends of the door-posts; to cut all requisite rebates and back-joints; to round off all corners where needful, and to perform the other work and labour proper and usual to masonry.

Quality, &c. of stone.

3461. The whole of the stone to be used in the mason's work is to be of the best quality, and hard, weather-proof, free from shakes rents and other defects, and is to be cleaned and left perfect at the time of rendering up the whole building as complete: all the stone is to be laid so as to be compressed in the way in which it was compressed in its natural bed.

SLATER. (See §§ 542—3.)

Countess slating. (See §§ 1023—8.)

3462. To slate the whole of the roofs with the best strong countess slating fixed with copper nails, with proper bond in every part thereof, as well near the ridges as at the other parts; and repair all defects caused by workmen or otherwise, and to leave the whole of the slating perfect at the rendering up of the premises as complete.

Pointing.

3463. To point the under side of all the slating with stone-lime mortar, with sufficient hair therein.

CARPENTER and JOINER. (See §§ 337—40.)

New materials. (See § 1029.)

Timber and deals. (See § 1031.)

Sundries. (See §§ 1032—3.)

Bond-timber.

3464. To put round each of the two stories of the committee-room and dwelling-house, two complete tiers of fir bond-timber scantling 4 ins. by 2½ ins.

Chain-bond.

3465. To put all round each story of the principal school-building a complete tier of fir chain-bond 5½ ins. by 4 ins.

To put round the walls of the stair-case two tiers of similar chain-bond.

(*This chain-bond is given as an example for reprehension: there never was a greater folly introduced in building than the support of a great portion of a wall upon timber, which experience proves so often rots treacherously, and suffers consequently the superincumbent brick-work or masonry to fall:* TRUE CHAIN-BOND CONSISTS IN THE PROVISION OF AN UNFLINCHING FOUNDATION AND IN THE CO-GRAVITATION *and in the consequent* CONSOLIDATION *of all the parts of a fabric.*)

All the bond-timber is to be properly halved, spiked, and dove-tailed, and is to be lapped full 6 ins. at all the joins.

Wood-bricks.

3466. To put all wood-bricks requisite for fixing the various works so requiring.

Lintels. (See § 1041.)

3467. To put to each of the four windows of the dwelling and committee-room, a lintel 9 ins. by 4 ins. and 5 ft. 6 ins. long.

To put to each of the two door-ways leading from the great stair-case to the dwelling, a lintel 9 ins. by 4 ins. and 4 feet long.

To put over the lower door leading from the stair-case into the school-room building, two lintels each 4 ins. by 4 ins. and 4 ft. 6 ins. long.

To put over the door leading into the boys' school, two lintels each 6 ins. by 4 ins. and 6 feet long.

To put over the closet in the boys' school, a lintel 9 ins. by 4 ins. and 5 feet long.

Centering.

3468. To provide, fix, ease when directed by the architect, and finally remove, centering sufficient for all the openings, arches, recesses, trimmers, and other parts of the building requiring the same.

Shoring, &c.

3469. To shore up as far as requisite the adjoining buildings, and to put such guards and hoards as may be requisite for inclosing the works next the two burial-grounds and next the adjoining yards.

Roof over boys' school. (See §§ 411. 430—48. and 520—50.)

	Ins.		Ins.
3470. Wall-plate	6	by	6
4 tie-beams cut cambering 3 ins.	10	—	4½
8 corbeilles each of oak 3 ft. 6 ins. long	4½	—	4½
8 principals at top 4 ins. by 6 ins.... ... at bottom	4	—	7
8 queen-posts (at top and bottom)	4	—	7
Ditto (in the waist)	4	—	4
4 straining-sills	3	—	2
4 straining-beams	6	—	4
8 struts	4	—	4
4 purlins (chamfered between the principals) ...	9	—	6
Plates across the gables to receive each pair of purlins	6	—	4
8 diagonal-ties to the purlins (each 4 feet long) ...	6	—	3½
8 blocks 2 feet long beneath ditto	9	—	4
4 diagonal-ties upon the wall-plate (each 6 ft. long)...	10	—	4
4 dragons upon ditto	10	—	2½
Pole-plate (suspended upon the tie-beams so as to leave parallel gutters. For reprehension of this method, see § 445)	4	—	10
Rafters	3½	—	2
Ridge (rounded for lead)	8	—	1½
Battens for countess slating	1	—	2¾

Roof over the principal staircase.

3471. Wall-plate	6	—	4
4 tie-beams	8	—	2½
Rafters	4½	—	2
Ridge and 2 hips (rounded for lead)	8	—	1
Longitudinal ceiling-joists spiked in one length beneath the tie-beams	4	—	2
Slate-battens	1	—	2¾

Roof over the dwelling.

3472. Wall-plate	6	by	4
4 tie-beams	8	—	2½
Rafters	5	—	2
Ridge and 2 hips...	8	—	1
Longitudinal ceiling-joists spiked in one length beneath the tie-beams	5	—	2
4 diagonal-ties 4 ft. 6 ins. long	6	—	3
2 dragons	6	—	2½
Slate-battens	1	—	2¾

Roofs over privies

3473. Wall-plates	4	—	2½
Rafters	3	—	2
Slate-battens	1	—	2¾

Gutters. (See § 520—3.)

3474. To prepare the whole of the gutters for the lead-work with inch yellow deal gutter-bottoms and proper bearers free from sap-wood; the gutters to the principal school-building are to be 12 ins. wide, and all the other gutters are to be 10 ins. wide at the least in the narrowest parts thereof, and the whole of them are to have currents 1½-in. at the least in every 10 ft. lineal, and to have 2½-in. drips rebated for lead where shown by the drawings. To put round the gutters, lear-boards of 1 in. yellow deal 10 ins. wide.

Dormer

3475. To put a dormer with frame and quarters complete

covered all over with inch yellow deal and with an inch yellow deal ledged door thereto hung with hinges bolt and stops complete: to put also an inner trap-door and linings and other fittings complete as to the dormer.

		Ins.	Ins.
floor of the building.	3476. Wall-plate	9	by 6
	8 girders chamfered. (*If internal columns be adopted, girders smaller in proportion may be used.*)	16	— 8
	Joists in one length	5	— 2
	Trimmers	5	— 2½
	Plates at the North and South ends of the joists ...	4	— 2½
	4 diagonal-ties upon the wall-plate 6 ft. long	9	— 4½
	Herring-bone struts between the Southern bay of the joists		
	1¼-in. yellow deal folding floor of half-boards listed free from sap-wood.		
floor of the building.	3477. Oak sleepers	4	— 3
	Fir joists	4	— 2
	1¼-in. yellow deal folding floor of half-boards listed free from sap-wood.		
of com- room and ng.	3478. Wall-plates	5	— 4
	Joists	10	— 2
	Trimmers and trimming-joists	10	— 3
	1 girder to lower floor	9	— 9
	1 girder to upper floor	9	— 5
	Inch yellow deal folding floor of half-boards.		
ipal land- principal	3479. Wall-plates	5	— 4
	Trimmers	7	— 4
	Joists	7	— 2
	1¼-in. yellow deal folding floor of half-boards listed free from sap-wood.		
nogged on between schools. wholly of work are to ferred. —50. 2.)	3480. Wall-plates	4	— 4
	Cross-plate above the door	6	— 4
	2 queens above ditto	6	— 4
	2 principals to ditto	4	— 3
	2 end posts	4	— 4
	2 lower queens	6	— 4
	2 posts	4	— 4
	2 lower principals or struts	4	— 4
	Quarters 13½-ins. apart	4	— 2
	2 tiers of inter-ties	4	— 1¼
nogged ons and ares to the s.	3481. Wall-plates	4	— 2½
	Quarters 13½-ins. apart	4	— 2
	Braces	4	— 2½
	1 tier of inter-ties	4	— 1¼
partitions on the of the ng.	3482. Wall-plates	5	— 4
	Quarters	5	— 2
	Cross-plates above the doors	5	— 4
	Side-posts and door-posts	5	— 3

	Ins.	Ins.
Kings	5	— 6
Struts above and below the cross-plates	4	— 3

1½ in. square framed partitions.

3483. To put 1½-in. square-framed deal partitions with panels of ¾ in. deal in three heights to inclose all the closets and to separate the rooms from the passages and stairs of the dwelling; and to put similar partitions 7 ft. 6 ins. high to separate the passages and lobbies on the lower story.

Solid window-frames. *(These would be preferable if of stone.)*

3484. To put to the whole of the windows of the stair-case and school-building (except to the three lesser windows of the North end of the lower school) solid fir frames 4 ins. by 4 ins. wrought rebated framed and chamfered according to the drawings and with oak sills and transoms, scantling 4 ins. by 4 ins.

Sashes and deal-cased frames.

3485. To put to the four windows of the committee-room and dwelling, deal cased-frames with oak sunk sills and 1½-in. ovolo sashes double-hung with large patent lines iron weights iron axle-pulleys and brass spring fastenings.

Window-linings, &c.

3486. To put to the windows of the stair-case and to the lower windows of the school-building inch deal rounded window-boards with proper bearers.

To put round the four windows of the committee-room and dwelling inch deal tongued and beaded linings.

Skirting.

3487. To skirt the whole of the committee-room and dwelling with ¾ in. square skirting 6½-ins. high plugged to the walls.

Door-cases.

3488. To put to the three yard doors and to the whole of the privies, fir proper door-cases 4 ins. by 4 ins., those to the privies and stair-case to be tenoned into the stone paving, and the other two door-cases to have oak sills 4 ins. by 3 ins.

1½-in. square framed doors.

3489. To put to the whole of the dwelling and to the committee-room, 1½-in. square framed doors each hung complete with 3-in. butt-hinges and with a best 7-in. iron rimmed lock with good brass furniture.

The folding-doors of the committee-room, are to be square framed and two inches in thickness, with inch deal panels and with two brass flush bolts and locks and hinges as to the other doors.

2 in. square framed inner doors to the school-building.

3490. To put to the school-building, 2-in. square framed internal doors, hung with 4-in. butt-hinges and with a good 7-in. iron-rimmed lock with brass furniture to each; the folding-doors of the boys' school are to have two 10-in. barrel bolts in addition.

Closet-doors, &c.

3491. To put to the closet in the boys' school 1½-in. square framed folding-doors, hung complete in 1¼-in. rebated linings with 3½-in. butt-hinges, two flush bolts, and a strong lock.

To put to all the other closets 1½-in. square framed doors hung complete with 3-in. butt-hinges and with a strong lock to each door.

CHAPTER XXXIII.

3 outer doors.

3492. To put to each of the three outer door-ways an 1½-in. bead-butt and square framed door, hung with a pair of 4 in. butt-hinges a Norfolk thumb-latch and two 10-in. barrel bolts.

Privy doors.

3493. To put to each of the privies a ¾-in. proper ledged door, hung with a pair of 18-in. cross-garnet hinges and a Norfolk thumb latch.

Door-linings.

3494. To put to each of the doors of the committee-room and dwelling, 1¼-in. single-rebated and beaded linings.

Fittings to the privies.

3495. To fit up each of the privies with 1¼-in. deal seat and riser with strong bearers.

Principal stairs.

3496. To construct the principal stairs according to the drawings, with very strong fir bracketed carriages, 1½-in. rounded rough oak treads and two lesser landings, inch wrought deal risers, 1¼ in. string-board, 1½ in. wrought and beaded outer string, bar-balusters 1½ in. square, turned and framed newels 4 ins. by 4 ins., oak rounded hand-rail 4 ins. by 3½ ins, with turned caps and scroll and curtail bottom step.

Lesser stairs.

3497. To construct the lesser stairs with inch deal treads and risers on strong bracketed carriages and inch deal string-boards.

Angle-staves.

3498. To put to the angles of all the fire-places in the committee-room and dwelling, small rebated angle staff beads.

50 ft. extra fir timber.

(See § 1071.)

Jobbing-work.

(See § 1070.)

SMITH.

Tie to church-yard wall.

3499. To provide and fix wrought-iron ties of the weight of 112 lbs. for securing the old church-yard wall to the new works, without causing the new work to settle and bind upon the old work.

Chimney-bars.

3500. To provide and fix a wrought-iron chimney-bar 2½ ins. by ½ in. for each of the four chimneys of the dwelling-house, with the ends thereof properly corked outside the jambs.

To provide the like for the four chimneys of the school-building 3 ins. by ½ in.

8 stirrups.

3501. To provide for and adapt to the roof eight wrought-iron stirrups turned up each out of iron 2½ ins. by ½ in., and 5 ft. long, and with keyed wedges and ½ in. bolts complete.

Eight ¾-in. bolts.

3502. To provide for the feet of the principals eight wrought-iron bolts ¾ in. in diameter, with nuts and washers complete.

224 lbs. ties, &c. (See § 1277.)

3503. To provide 224 lbs. additional of iron in such ties straps and bolts and other light wrought and hammered work as the architect may direct.

Rain-water-pipes. (See § 1164.)

3504. To put complete stacks of 3½-in. cast-iron rain-water-pipes in the situations where shown by the plan of the roof, with large heads, and leading down into the funnels of the drains, and to put at the north-east angle of the dwelling a 2½-in. cast-iron rain-water-pipe with head complete.

Windows.

3505. To put to the whole of the windows (except to the dwelling-house) cast-iron sashes as light as the same can be with convenience made, with bars to receive diagonal diamond squares 9 ins. high and 5 ins. wide; each window is to have a strong casement hung therein on centres, and with fastenings and lines complete.

To put to the three narrow windows at the North-end of the lower story, cast-iron rebated frames, average scantling 1½ in. by ¾ in., with seven fangs thereon 9 ins. long, to extend into the brickwork.

All the iron sashes, casements, and frames, are to be properly fitted and adjusted.

Gates.

3506. To put to the entrance a pair of framed iron-gates, 8 ft. high, with wrought-iron side styles 1½ in. square, four wrought-iron cross-rails and a circular brace, each 3 ins. by ⅝ in., cast-iron bars one inch square, filled in between the styles, and placed diagonally, not more than 4 ins. apart, ornamental cast-iron trois-feuille heads to the bars, strong wrought-iron carriages with cast-iron caps over the upper joints, bell-metal lower sockets, strong bolt and socket, and good lock with copper wards and two keys.

PLASTERER.

Floated ceilings.

3507. To lath, plaster, float, set and whiten ceilings to the lower school, principal stair-case, large entrance lobby, and to the lower rooms of the dwelling.

Other ceilings not floated.

3508. To lath, plaster, set with square angles, and whiten, all the other ceilings of the dwelling.

Rendering.

3509. To render, set with square angles, and colour, all the brick-work of the dwelling.

Partitions.

3510. To lath, plaster, set with square angles, and colour all the quartered-partitions of the dwelling.

School chimneys.

3511. To stucco with Parker's cement and colour the four chimney-fronts of the school-rooms so as to appear like jambs and mantles 9 ins. wide.

(*This was for present cheapness and quick renewal.*)

Beads, &c.

3512. To execute all requisite beads, quirks, and arrises.

CHAPTER XXXIII.

PLUMBER.

7 lb. cast-lead to gutters.

3513. To lay all the gutters with 7 lb. cast-lead turned up 6 ins. against the brick-work and 10 ins. against the rafters.

4 lb. milled-lead flashings.

3514. To put round all the gutters 4 lb. milled-lead flashings 5 ins. wide.

4 lb. milled-lead to ridges and hips.

3515. To cover all the ridges and hips with 4 lb. milled-lead 16 ins. wide properly secured with lead-headed nails.

Step-flashings, &c.

3516. To cover all the ends of the slating next the gables and chimneys with 4 lb. milled-lead flashings 9 ins. wide with 4 lb. milled-lead step-flashings let into the brick-work and turned down over the other flashings.

Dormer.

3517. To cover over the whole of the outside of the dormer with 6 lb. milled-lead turned down 6 ins. over the slating, and with an apron to the dormer-door of similar lead 12 ins. wide.

Waste-pipe, &c.

3518. To put to the urine-sink in the boys' yard a strong 2-in. waste-pipe and a brass bell trap and grate.

PAINTER.

4 times in oil to the wood-work.

3519. To paint four times with the best oil-colour, the whole of the wood-work usually painted of the whole of the buildings.

5 times in oil to the iron work.

3520. To paint five times with the best oil-colour every part of the smith's work of every kind, the first two coats thereof being red-lead paint.

The whole of the work is to be properly knotted, stopped, and prepared. (See § 3053.)

GLAZIER.

3rd Newcastle crown glass.

3521. To glaze the whole of the windows and lights throughout the building, with good third Newcastle crown glass, and to clean and leave the whole thereof perfect at the completion of the building.

CHAPTER XXXIV.

A SPECIFICATION *for the erection of a new School-room and for sundry alterations additions and repairs to the present buildings of the* FREE GRAMMAR SCHOOL *founded at in the County of by and for completely finishing the said buildings and works in every respect agreeably to the Drawings hereunder enumerated and according to such further explanatory Drawings as may be given by the Architect.*

(Insert here a list of the Working-drawings. See § 986. *)*

BRICKLAYER.

Digging.

3522. To excavate the ground for the foundations of the walls of the intended new school-room and other buildings to the depth of 3 ft. below the level of the present surface of the ground at the angle of the intended buildings; to prepare the trenches in a proper manner level and hard for the reception of the intended new brick-work; and to fill in the ground to the walling and other brick-work and walling, after the same are carried up.

To excavate over the whole extent of the ground under the intended new school-room and out-buildings to the depth of 12 ins. and also to dig out where requisite for the piers under the sleepers.

All the superfluous earth and other matters resulting from the excavations are to be removed to

3523. In the digging should any old foundations or other impediments present themselves, the contractor is to remove the same utterly at his own expense, so that no irregular bearings may occur in any part of the buildings; but the contractor is not to be called upon to furnish any under depths of brick-work or other walling so rendered necessary without his being remunerated for the same.

3524. There exists with some persons an absurd mode of making the depth of the foundations included in a contract to depend upon the necessities of the case as discovered during the progress of the work, instead of ascertaining previously what will be exactly required, or providing for such additional work or for such deviations as will appear to be necessary when the ground is excavated. No prudent man who has any regard for his property would make any contract containing such an uncertainty: such an agreement might suit a speculator, but not an honest builder.

Gravel.

3525. To take up carefully the whole of the gravel laid to form the present school play-ground, wherever the same will be of necessity broken up; to remove and set the same apart in such

part of the premises as the architect shall direct; and when the brick-work and walls are completed, to restore the gravel around the buildings in a proper manner so as to correspond with the gravel-work of the other parts of the play-ground; and all the superfluous gravel is to be left on the premises for the future use of the same.

If any new gravel be required a clause accordingly stating the thickness of the stratum must be inserted. (See § 3332.)

Rubbish. (See § 989.)

Removal of old work. 3526. To take down and remove carefully and in order to carry into execution the intended new works according to the drawings. To set apart for the use of the masons all the stone-work; and to remove and cart away from the premises all the other materials (except) which may be found thereon.

Take down. 3527. To take down and dispose of the materials in the same manner as last described the and the in order to

New wall. 3528. To rebuild the whole of the wall to the present building, with and according to the drawings of brick-work, ins. thick, with two courses of footings ins. thick, and two courses of footings ins. thick.

Other new brick-work. 3529. To execute all other new brick-work requisite for carrying into effect the design of the new buildings, according to the working-drawings, and to render the new work and the old work complete together; the brick-work is to be filled in solidly behind all the ashlarings and other stone-work.

Indents. 3530. To cut and parget in the old work proper perpendicular chases for the reception of the new brick-work, and to repair and make good with sound stock-bricks set in one half new quick Parker's cement and one half river sand all the brick-work and walling which may be shattered or injured by cutting the chases.

Piers under the flooring. (See § 1000.)

Rough arches and counter-arches. (See § 2897.)

Ganged-arches (if any.) (See §§ 358, 570—4, and Index.)

Alterations to front. 3531. To rebuild according to the drawings the front of the present and such parts of the front of as will so require on account of the intended alterations according to the drawings.

Internal alterations. 3532. To assist in taking out the timbers of the where the stories are not on a level with the principal parts of the building; to stop up with solid brick-work all defects

and holes which may thereby be discovered or left in the walls and brick-work; and to cut out for and make good to all the timbers intended to be inserted so as to render the levels of the stories of this part of the building the same as those of the other parts of the adjoining buildings.

Other alterations.

3533. To cut out for windows in the wall of the old building in lieu of those which will be destroyed by the intended additions; and to build new reveals jambs and arches, and otherwise make good thereto with sound new stock-bricks set in Parker's cement and sand mixed together in equal measures.

Bedding, &c. (See § 999.)

Drainage, cess-pools, &c. (See §§ 1001—4, and Index.)

White brick facings (if any.) (See § 1097.)

Yellow brick facings (if any.) (See § 1365.)

Other facings (if any.) (See Index.)

4 rods extra brick-work. (See § 1007.)

Bricks. (See § 1008 and Index.)

Mortar. (See § 1009.)

Mode of doing the work. (See § 1010.)

Reparation of accidents, &c. (See § 1111.)

3534. All the walls and other brick-work are to be built level and perpendicular unless where otherwise shown by the drawings; and should any damage occur thereto from accident, settlement, or other cause within from the time of rendering up the building and works as complete, the contractor is to make the same good as may be by the architect directed.

New tiling (if any.)

3535. To tile the whole of the with the very best new plain-tiling laid to a close gauge on heart of oak double laths, with all the plain-tiles pegged, and with hip-tiles and ridge-tiles set in Parker's cement and with T nails dipped in hot pitch in all the joints thereof, and with strong wrought-iron hip-hooks pitched in like manner, and also with filleting of Parker's cement with strong cast-iron nails driven into the walls and other brick-work not more than 3 ins. apart, in order to secure the same. (*See observations upon roof-fillets*, §§ 1028 and 3348.)

Old tiling.

3536. To strip off the tiling from the roofs over , and to re-tile the said roofs in the same manner upon new oak laths and in all other respects as last described (*in clause* § 3535), using only such of the old tiles as remain perfectly sound and undecayed, and providing new sound tiles sufficient for making up all deficiency.

3537. To repair with the requisite new sound tiles, laths, and other materials, all the defects in the roofs over ,

and to leave the same water-proof and complete: every tile is to be pegged by being reached from the inside if necessary of the roof.

All the plain-tiles are to be laid closely in stone-lime mortar with sufficient hair therein, no mortar appearing on the outside.

3538. *Conical hip-tiles which lap over each other should be used if the buildings be in a situation where tiles of that description can be readily obtained. These tiles may be made with a species of crockets upon their lower ends, for the embellishment of roofs.*

MASON. (See §§ 265—295.)

(See §§ 1373, and Index.)

Yorkshire stone to the foundations (if any.)

Plinth (of granite, Kentish rag-stone, Portland stone, Bramley-fall stone, or sand-stone, as the case may be. Bath stone and other soft materials are highly improper for the purpose.)

3539. To provide and fix all round the intended new buildings a complete plinth of , 3 ft. high and 1 ft. thick, in pieces none less than 3 ft. long, with quoin-stones returned in the solid stone full 2 ft., chamfered on the top (*or moulded as the case may be*) and plugged with lead at all the joints.

3540. *If the plinth be of stone less than* 12 *ins. thick, there should be two cramps of copper or of gun-metal in each vertical joint of it, for which see* § 3860. *The careful architect will avoid the meanness and unstable construction of a lofty plinth of very thin stone merely paved as it were against the brick-work: sometimes the bases of buildings are in modern times flaked over with Yorkshire paving-stones; but this is incurring an useless expense to render the building mean both in appearance and structure.*

Stone casing to the new buildings.

3541. To case over with stone-work the whole of the north front, east front, and of the intended new school-room and , with the projecting towers buttresses turrets and other decorations thereof according to the drawings.

All the ashlaring is to be cut out in courses to suit in height three courses (*or more as the case may be*) of the brick-work or somewhat less than 9 ins. in height; the whole of the ashlaring is to be formed in the manner of and in the proportion of the Flemish bond of brickwork, that is, alternately with headers 8½ ins. deep from the external face of the work, and with stretchers 4 ins. deep from the external face of the work, and twice the length of the headers, so that the average thickness of the ashlaring will be 5½ ins. exclusive of the quoins which are in no instance to show returns of less than 12 ins.

3542. *If parsimony be not consulted, or if the building be in a county where good and durable building-stone is plentiful, the bond-stones or headers may be carried in further, and the stretchers may be* 6 *ins. thick or more, or the walls may be entirely of solid stone.*

Buttresses.

3543. To form the buttresses at of stone the same as the ashlaring, but with ins. additional thickness, so as

not to show any return of brick-work, and with water-tables to correspond with those of the present building (*or according to the drawings as the case may be.*)

Water-tables to the towers.

3544. To put to the towers water-tables of stone according to the drawing scantling 10 ins. high and 13 ins. bed, and each water-table in as few pieces as possible.

Water-tables at the feet of the turrets.

3545. To put all round at the feet of the octagonal turrets stone water-tables 6 ins. high and 12 ins. bed; each of these water-tables is also to be in as few pieces as possible.

Turrets.

3546. To case round (*or construct entirely as the case may be*) with stone all the turrets; the embattled heads of the turrets are to be each in one piece of stone, cut through to such of the turrets as have chimney-flues therein.

Cornices.

3547. To finish the walls according to the drawings with cornices of stone, scantling 6 ins. high, and 9 ins. bed, and to put round the similar cornices.

Battlements.

3548. To form entirely of stone the embattled parapet along the whole of the and fronts of the new buildings, and the front and of the present building, the blocks or plain parts of the battlements, between the embrasures are to be of solid stone, 6 ins. thick, each of one piece, as near to the length of 2 ft. 9 ins. as the general length of the front will admit. To cope the whole of the battlements, and embrasures, with stone scantling 8 ins. high and 9 ins. bed, worked according to the drawings: the whole of the coping of the battlements is to be without vertical joints, and each piece of stone is to be set with two plugs of copper ½ in. square and 2 ins. long.

Gables.

3549. To finish the gables with stone cornices, 6 ins. by 18 ins., in stones as long as possible, and with solid springing-stones and apex saddle-stones.

Coverings of the oriel-windows.

3550. To cover over the tops of the two oriel-windows, with stone scantling 1 ft. high, and 2 ft. bed; wrought and moulded according to the drawings.

3551. *If the oriel-windows are to be pendent from the walls instead of standing upon the ground, or if they are to have, stone mullions, frame-work, and tracery as they should have, here insert a clause accordingly, for which see Index.*

Arms.

3552. To provide and fix the arms of and sculptured in a spirited and highly finished manner with their mottoes, upon slabs of Portland stone, each ft. ins. by ft. ins., and 10 ins. thick, and secured each by four copper cramps clinched in the brick-work, and each weight 12 oz. avoirdupoise.

(Arms may with great propriety be formed of Coade's artificial stone, and if sufficiently burnt and of sufficient substance, may be much more durable than they would be if of free stone.)

CHAPTER XXXIV.

Springing-stones.

3553. To put for the support of the arches under the turrets and No. springing-stones of Yorkshire stone *(or of granite curb, or of Purbeck stone, or of as the case may be)*, each 2 ft. long, 12 ins. wide, and 8 ins. thick.

Step.

3554. To put to the external door-way a step of stone, scantling 14 ins. by 8 ins., and ft. ins. long, properly back-jointed.

Chimney-pieces.

3555. To put in the intended new school-room a Gothic chimney-piece of solid Portland stone, according to the drawings with a slab of Portland stone, ft. ins. by 2 ft. 6 ins., and 2½ ins. thick.

Alterations, &c. to the old front.

3556. To alter and make good and complete the stone-work of the old fronts of the present building, according to the drawings, so as to adapt the same to the intended new buildings, and so as to render the stone-work of the new buildings, and of the old buildings complete together.

Quality of the stone.

3557. All the stone-work (except where herein otherwise described) is to be cut out quite square, free from shakes, vents, and all other defects; and all the stone is to be laid in the work so as to be compressed in the manner in which it was compressed in its natural quarry-bed.

Lead plugs and water-joints.

3558. All the vertical joints in the cornices, water-tablings, and other projecting stone-work, are to be plugged with lead and are to be formed as proper water-joints grooved and channeled with lead, and with ridges thereto worked out of the solid stone in order to prevent the wet from draining into the joints.

CARPENTER and JOINER. (See §§ 337—40.)

New materials, &c.

(See § 1386.)

Timber and deals.

(See §§ 1031—2.)

Pulling down, shoring up, &c. and altering old fronts.

3559. To take out the timbers of the one-pair floor of the Northern part of the present school-buildings, where the same adjoin to the situation of the intended new school-room; to shore up the floors and roofs during the time that the intended alterations are being made to the old buildings, and to put new floors to the North part of the school-building, on a level with the parts of the building to the South thereof, and with timbers of scantlings corresponding with the scantlings of the timbers of such more Southern adjoining parts of the building, but nevertheless using such of the old timbers to be taken down from the present floors as may turn out sound and sufficient in scantling; and to lay to such floors of the old buildings the old boards to be taken up from the same which may remain perfectly sound and in thickness not less than ⅞ in., and providing all new inch yellow deal free from sap-wood which may be requisite for making good and completing such boarded-floors.

Library timbers.

3560. To enlarge and make good the timbers of the roof and other parts of the library which will of necessity be altered by carrying into execution the intended additions and works according to the design; and to make complete the boarded-floor so as to correspond with the other parts thereof.

Old finishings.

3561. To repair, refix, alter, enlarge, and make good all the other old finishings which may be disturbed by making the intended alterations.

Ground joists sleepers and floor.

3562. To lay to the whole of the new school-room, to the building attached to the West end of the same, and also to that part of the old building which lies between the present school-room and the intended new school-room, oak joists scantling 4½ ins. by 2½ ins. on oak sleepers 4½ ins. by 3 ins., and to lay all the ground-joists with 1½-in. wrought yellow deal listed free from sap-wood, and rebated and filleted underneath.

Oaken lintels. (See § 1041.) In the case for which this specification was made there were oaken external window-lintels perfectly sound, although placed at the outside of the building in the reign of Henry VIII.

3563. To put over each of the three windows of the Northern front of the school-room, an oaken lintel scantling 13 ins. by 5½ ins.; to put over the large folding-doors leading to the new school-room two lintels of oak, each 8½ ins. high and 4 ins. thick; to put to the blank or recess answering to the folding-doors an oaken lintel 9 ins. by 8½ ins.; and to put to each of the other new door-ways a lintel 4½ ins. high and of the thickness required by the wall. All the lintels are to have at least 9 ins. bearing upon the wall at each end thereof.

Oaken wood-bricks.

3564. To put the wood-bricks of oak timber requisite for the ends of the lintels and for fixing the various finishings.

Bond-timber.

3565. To put two tiers of oaken bond-timber round the whole of the intended new school and the Western passage or entrance thereto, in order to fix the dwarf wainscotting.

To put two tiers of oaken bond-timber round the whole of the school-room, in order to fix the ceiling-joists and brackets thereto.

To put one tier of oaken bond-timber round each of the two rooms for containing packing-boxes.

To restore and make complete the bond-timber in each story of the old buildings where any parts of the same are directed to be altered or rebuilt.

All the bond-timber is to be of scantling 4 ins. by 2½ ins. and is to be properly spiked and halved and lapped 6 ins. at all the joins thereof.

Roof of the old buildings.

3566. To take down the present wooden cornice and the guttering along the whole Eastern front of the present building; to make all the alterations which may be requisite to the rafters'-feet to the wall-plate and to the other timbers of the roof, restoring and amending such thereof as are decayed, imperfect, or insufficient; and to lay to the whole front new 1½-in. oaken gutter-boards listed free from sap-wood on strong bearers with a 2½-in. drip at every 15 feet in length of the guttering, rebated to receive the ends of the lead-work thereof, and with current 1½ in. to every 10 ft., and a cess-pool is to be formed about the centre of the gutter to lead to a rain-water pipe.

HAPTER XXXIV.

To make to the roof and gutters of the library-building, all additions, alterations, and reparations which will be required thereto in consequence of building the new Eastern front.

of of the new ool-room. e §§ 411, 430— and 520—50.)

3567. To construct the roof over the intended new school-room entirely of oak timber, with wall-plate 8 ins. by 4½ ins. diagonal-ties and dragons 12 ins. by 2½ ins., pole-plate 5 ins. by 4 ins., framed blocks not more than 12 ins. apart between the wall-plate and pole-plate, rafters 4 ins. by 2¼ ins., ridge 8 ins. by 1¼ in., hips 14 ins. by 1½ in., purlin 8 ins. by 5 ins., four framed trusses with tie-beams 12 ins. by 6 ins. principals 6 ins. by 5 ins. at bottom and 5 ins. by 6 ins. at top, queen-posts 6 ins. by 5 ins. in the waist, collar-beams 6 ins. by 6 ins. and struts 4 ins. by 4 ins. To lay to the roof gutters as described to the old Eastern front of the buildings, and to fit up the ceiling with ceiling-joists 3 ins. by 2 ins. with a crown-piece 8 ins. by 2½ ins. and two binders 12 ins. by 2½ ins. in order to receive the same; to put at the feet of the ceiling-joists along two sides of the new school, 1-in. yellow deal cove-brackets not more than 12 ins. asunder; and to put also beneath the same, small brackets to receive the cornice of the two sides of the room.

of of the low ilding.

3568. To construct the roof over the low building attached to the Western end of the intended new school-room, entirely of oak timber, with wall-plates all round 4 ins. by 4 ins., rafters 6 ins. by 2¼ ins. pitched upon a crown-piece in the wall of the lof-tier building-scantling 4 ins. by 2½ ins., two diagonal-ties each 6 ft. long, and dragons each 3 ft. long, both scantling 6 ins. by 2½ ins., hips 8½ ins. by 1¼ ins., gutters as described to the other parts of the building, and ceiling-joists 4 ins. by 2 ins.

ar-boards.

3569. To put to all the new gutters ¾-in. yellow deal (or oak as the case may be) lear-boards 10 ins. wide.

rthern win-ws.

3570. To put to the three Northern windows of the intended new school-room, wrought framed rebated and chamfered transom window-frames of oak scantling 4 ins. by 6 ins.

astern windows.

3571. To put to the two box-rooms chamfered and rebated oak frames 4 ins. by 5 ins., with Gothic arched heads.

iel windows.

3572. To construct the two bay or oriel windows with oak transom frames moulded according to the drawings, with Gothic arched heads and oak cornice and quatre-feuille blank paneling also of oak.

The oriel-window to the library is to have 1½-in. moulded and square framed shutters thereto the whole height thereof and with three panels in the height with grooved slides at top and bottom, and brass friction-rollers for the shutters to slide laterally, and with quarters 6 ins. by 2¼-ins. in front, plates 6 ins. by 4 ins., and two tiers of inter-ties 4 ins. by 1½-in. to conceal the shutters: and to put round the library oriel-window, a ploughed ground with moulding 6 ins. girth, and ¾ in. beaded lining.

d windows.

3573. To repair and re-fix the old window-frames of the ancient building where the same are to be moved in order to render

the front more uniform; and to reinstate with new materials and to enlarge and alter the same where requisite; the external lintels of the windows are to be refixed, and new oaken lintels are to be provided in lieu of those which may turn out unsound or insufficient.

Western door.

3574. To put to the Western entrance of the school-room an oak proper door-case scantling 5 ins. by 4 ins. with arched Gothic head; and to hang in the same a 2½-in. framed right Dutch wainscot door with moulded styles and rails, filled in with inch wainscot battens with moulded fillets laid over the joints thereof; the back of the door is to be flush and is to be beaded at all the joints thereof; to put to the same doors three 5-in. butt-hinges, a good French plate latch, and two 9-in. bright rod bolts.

Folding-doors.

3575. To provide and hang in the door-way leading from the old building to the new school-room, a pair of 2-in. square-framed folding-doors three panels high, and with panels not more than 8½ ins. wide; the doors are to be hung with three pairs of 4-in. butt-hinges, two brass flush bolts, and a 10-in. draw-back iron rimmed lock, in 1½-in. chamfered grooved and beaded single-rebated square framed linings.

Doors to box-rooms and passage.

3576. To hang in the three inner door-ways, opening from the passage at the West end of the new school-room, 1½-in. wainscot square framed four-panel doors, hung with a pair of 4-in. butt-hinges and an 8-in. draw-back iron rimmed lock to each.

Recess in new school.

3577. To fit up the recess in the new school-room, with 1½-in. folding-doors, and fittings to correspond with the other folding-doors but with a 6-in. dead-lock; and to put within the recess a 1½-in. deal upright division, and six beaded shelves of inch deal 8 ins. wide.

Dwarf wainscotting.

3578. To fit up the whole of the intended new school-room and the West passage thereto with 1¼-in. real Dutch wainscotting 6 ft. high, with bottom-rail 8 ins. high, styles and top-rail 4 ins. wide, and panels not more than 8 ins. wide, the whole to be formed in gothic compartments, and to be finished with large gothic moulded capping.

Stair-case and partitions.

3579. To construct an entire new stair-case within the present old building according to the plan with 1½-in. oak treads and landings and 1¼-in. risers on strong bracketed oak carriages, 1¼-in. wainscot plain beaded string-boards, octagonal oak newels, strong square wainscot bar-balusters, and wainscot moulded hand-rails with mitred caps.

To inclose the whole of the stair-case on each side and the two small rooms adjoining thereto, with new quartered-partitions with plates 4½ ins. by 3 ins., quarters 4½ ins. by 2¼ ins., posts 4½ ins. by 4 ins., braces 3 ins. by 4½ ins., and inter-ties 4 ins. by 1¼ in. at every 5 feet.

To fit up the two folding door-ways by the new stair-case, in manner similar to the folding-doors leading into the intended new school-room.

To fit up the door-ways of the two small rooms between the

folding-doors with linings, doors, and ironmongery the same as to the bed-rooms.

To put against the new quartered-partitions forming the small rooms between the old school and the new school, square skirting 8½ ins. high with proper grounds and backings.

SMITH.

Chimney-bar.

3580. To put to the new school-chimney a wrought-iron bar 3 ins. by ¾ in. properly corked on the outside of the chimney-jambs.

Ties.

3581. To put six wrought-iron-ties 2½ ins. by ½ in. and 4 ft. long, with dogs and staples to secure the new Northern gable-wall to the old building; the ties are to be inserted in the new brick-work while it is being carried up, but not to be secured to the old work till the new work is settled.

To put six similar ties to secure the new Eastern front of the library to the old work.

Roof.

3582. To put to each of the four trusses of the roof over the new school-room, a pair of wrought stirrup-irons 2 ins. by ⅜ in. turned up from a length of 5 ft. 6 ins. with proper bolts and keyed wedges; and to put also to each truss a pair of ¾ in. bolts 2 ft. long with nuts and washers complete, to confine the feet of the principals.

Rain-water-pipes. (See § 1104.)

3583. To provide and fix three complete stacks of cast-iron pipe 4 ins. bore with heads and shoes complete, to lead the rain-water into the drains or funnels.

To provide and fix two stacks of pipe 2½ ins. bore to lead the rain-water from the lower West building into the drain and with heads and shoes.

Saddle bars, casements, &c.

3584. To make good the saddle-bars and other iron-work of the old windows intended to be moved and altered.

To put to the whole of the new windows sufficient wrought-iron saddle-bars ¼ in. square, and not more than 1 ft. 8 ins. apart, and extending 4 ins. at each end into the solid jambs.

To put to each of the oriel-windows four casements of wrought-iron with hinges and fastenings complete: each casement is to occupy one division of the windows.

To put to each of the other new windows a casement similar to those last described.

PLASTERER.

INTERNAL WORK.

Library and old buildings.

3585. To make good the ceiling, the stucco-work, and the other plastering of the library, and of the other parts of the old

buildings, where the same are intended to be altered or rebuilt.

To plaster the sides of the new quartered-partitions with floated bastard stucco.

ew school-room
id out-building.

3586. To lath plaster float and set the gothic ceiling of the intended new school-room, and the ceilings of the Western passage and of the two box-rooms leading therefrom.

To plaster with floated bastard stucco the sides of the new school-room and of the passages leading to the Western entrance to the same. All the windows are to have the splays thereof properly run with quirked beads.

To lath, and run on two sides of the new school-room, at the foot of the cove, a plaster Gothic cornice according to the drawings.

To run round the internal reveal of the Northern oriel-window, plaster Gothic mouldings according to the drawings.

EXTERNAL WORK.

epairs to old
arker's cement.

3587. To repair in a neat manner after the performance of the intended alterations, the Parker's cement of the Western front of the old buildings; to joint the new parts of the stucco thereof in imitation of masonry; and to colour the whole of the front from the new school Southwards as far as the break in the wall.

To stucco in an able manner with Parker's cement jointed in imitation of stone the whole exterior of the intended new (except the stone-work thereof described in the mason's work) with all the plinths splays projections mouldings battlements and decorations according to the drawings.

Vhitting and
louring, &c.

3588. To whiten all the new ceilings mouldings and strings; to wash stop and whiten the whole of such of the ceilings and cornices as will require reparation in consequence of the alterations intended to be made to the buildings.

To colour in imitation of stone all the new internal stucco-work except that to the library.

To lime-whiten twice all the internal brick-work of the two box-rooms.

To run all requisite beads quirks and arrises.

To colour the new Parker's cement stucco while yet soft from time to time (as any small portion thereof is completed) with a coat of rough colour, in order to form a ground-colouring; and when the said stucco-work is dry, to teint the same in imitation of stone, with proper weather-proof outside colouring mixed with Russian tallow, beer-grounds, tar, and the other proper ingredients.

PLUMBER.

Ibrary.

3589. To relay and make good as far as may be necessary the lead-work of the roof over the library.

ew gutters.

3590. To lay the gutters to the new embattled Eastern parapet of the present building, and to the roofs of the intended new school-room and to the out-building thereof, with cast-lead, weight 8 lbs. to the foot superficial, turned up 6 ins. against the walls and 10 ins. against the rafters.

[redacted]

CHAPTER XXXV.

Flashings.

3591. To put to all the gutters flashings of 5 lb. milled-lead 6 ins. wide.

PAINTER.

3592. To paint four times with the best oil-colour of such plain colours as may be directed, all the new wood-work and new iron-work usually painted; and to bring forward and paint twice with the best oil-colour all the old wood-work iron-work and other works which are to be altered, and which before were or which usually are painted.

To paint four times with the best oil-colour to match the rest of the room, all the new stucco-work of the library.

GLAZIER.

3593. To glaze all the new windows with second Newcastle crown glass in lozenges about 10 ins. long, set in strong church window-lead, with strong copper bands to secure the same to the iron saddle-bars.

To repair all the glazing and lead-work of the old windows intended to be altered and moved.

To clean and leave perfect the whole of the new glazing immediately prior to rendering up the other works as complete; and to make good all the other glass which may be damaged by the various workmen or otherwise during the time that the works of the contract are being fulfilled.

CHAPTER XXXV.

SPECIFICATION FOR WORKS *to be done at the* PAROCHIAL CHARITY SCHOOL *situate in in order to afford more commodious* COMMITTEE-ROOMS *and* ADDITIONAL APARTMENTS *for the use of the Mistress.*

(Insert List of Working-drawings, see § 986. *)*

BRICKLAYER.

District-surveyor.

3594. To give to the District-surveyor the requisite notice and pay to him his proper official fee.

Chimneys, &c.

3595. To cut away the present old southern chimney-breast of the girls' school, and to carefully make good in a workmanlike manner the wall against which the same at present stands.

3596. To cut out the brick-work according to the drawings, and to form in the most careful manner, flues for the intended two new chimneys, turned pargeted and cored in a proper and workmanlike manner; and to erect jambs and sufficient other additional brick-work for completing the two chimneys: to put to each new chimney-breast, a chimney-bar of wrought-iron 3 ins. by ½ in.; to carry the flue of the kitchen-chimney into the present old southern flue of the girls' school; and to carry from the chimney of the new occasional committee-room, a chimney-shaft as high as the ridge of the main roof of the school-building, and to finish the same with salient-courses 6 ins. high and double plain-tile cresting and to put thereon a first-sized chimney-pot, set in plain-tiles; the salient-course, the tiles and the chimney-pot being all set in new quick Parker's cement and Thames sand mixed together in equal measures. To put to each new fire-place a 4-in. brick trimmer 12 ins. longer than the chimney-opening.

New passage-window.

3597. To cut out the brickwork for the intended window in the southern wall of the main school-building; to rebuild the brick-work round the opening; to form proper window-jambs; and to turn an arch over the opening; and to bed and point round the intended window-frame thereto.

Cutting out, &c. to quartered-partitions.

3598. To cut out the brick-work in order to receive the ends of the heads and sills of the quartered-partitions, and the other work so requiring; and to make good carefully the brick-work thereto.

Opening leading to boys' school.

3599. To cut an opening in the situation shown by the ground plan, to lead from the southern vestibule and the stair-case of the school-building, directly opposite to the present southern door-way of the boys' school; and to make good in a careful and workmanlike manner the jambs thereto; to turn an arch over the same, and to fill in the brick-work about the same.

Temporary opening.

3600. To cut a temporary aperture through the wall between the boys' wardrobe and the northern entrance to the school-buildings, for the purpose of admitting materials to be brought into the boys' yard during the progress of the works; and to rebuild and make good in a workmanlike manner the brick-work to the same wall after the completion of the other works.

Materials.

3601. All the brickwork is to be done with the best new hard-burnt square grey stock-bricks and such only of the old bricks (which will be taken down from the building) as will remain sound and unbroken; and the whole of the brick-work is to be laid (except where otherwise directed) in mortar compounded of one third by measure of the best Dorking stone-lime and two thirds by measure of the best clean Thames sand.

Rubbish.

3602. To remove from the premises from time to time during the progress of the works all rubbish which may accumulate there-

in, and to leave the premises of the school clear therefrom at the final rendering up of the same as complete and finished.

MASON.

low-sill.

3603. To put to the intended new window at the end of one of the new passages, a sill of 3-in. Yorkshire stone 9 ins. wide, wrought with tooled fair-edge, throated in front, and laid sloping.

ney-pieces.

3604. To remove the present Southern chimney-piece hearth and slab of the girls' school, and to alter, repair, re-fix, and make complete the same in the intended new kitchen.

To provide and fix in the intended new occasional committee-room, jambs, mantle, and shelf, each of 1½-in. Portland stone 7 ins. wide, a slab of 2-in. Portland-stone 1 ft. 6 ins. wide and 4 ft. 3 ins. long, and a hearth of 2½-in. rubbed Yorkshire stone.

To provide and fix in the floor as shall be hereafter directed, a piece of 2-in. Portland stone paving 4 ft. square.

ern.

3605. To provide and fix in the intended new kitchen, a cistern to contain 12 cubic feet of water, composed of the very best perfect slate at least 2 ins. thick, rebated or tongued together, secured by strong copper bolts, and made water-proof, and fixed and made complete with all requisite bearers and other work.

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3606. To provide and fix in the kitchen a sink of Yorkshire stone 7 ins. thick containing 8 ft. superficial, with a pipe-hole therein and fixed with all proper bearers complete.

CARPENTER and JOINER. (See §§ 337—40.)

erials, &c.

(See §§ 1029—33.)

rtered partns. (See §§ —50, and —2.)

3607. To divide off and inclose the three intended new rooms and the two intended new passages on the one-pair story of the school-building, with quartered-partitions as shown by the drawings, with timbers according to the following scantlings:

	Ins.		Ins.
Heads and sills	4	by	4
Queen-posts	5½	—	4
Collars	4	—	4
End-posts	3	—	4
Door-posts and door-heads	3½	—	4
Three principal struts	3½	—	3½
Other struts and braces	3	—	3
Quarters not more than 12 ins. apart	2½	—	4
Two tiers of inter-ties to each partition	1¼	—	2½

The quartered-partitions are to have the sill in all cases placed below the flooring-boards, except where the same cannot be effected without injury to the timbers of the flooring.

New ceiling-floor.

3608. To put over the intended two new principal rooms, and over the intended two new passages, ceiling-floors as shown by the plan, with binding-joists 8 ins. by 3 ins., and with ceiling-joists 3 ins. by 2 ins. not more than 12 ins. apart spiked in one length (without scarfing) all across the building, and with the requisite strong fillets to receive the same on the sides adjoining the brick-work.

Iron ties, &c.

3609. To provide and fix 112 lbs. avoirdupoise of wrought-iron in such ties, straps, screw-bolts, and other wrought-iron work, as the surveyor may direct. (See § 1277.)

Centering.

3610. To provide and fix all centering requisite for turning the new arches and trimmers.

Make good floors.

3611. To trim the floors to the intended new chimneys; to relay and make good the floors over the sills of the quartered-partitions, round the slabs of the intended new chimneys, at the place where the Southern chimney of the girls' school at present stands, in the opening intended to be made leading to the boys' school, and wherever else the building may be affected by the intended works.

New window.

3612. To fit up the intended new window in the Southern wall of the school-building, with a lintel of Baltic fir, 5 ft. 6 ins. long, scantling 13 ins. by 6 ins., sufficient wood-bricks, and 1½ in. ovolo sashes, glazed with second Newcastle glass, and double-hung with large patent lines, iron-weights, brass axle-pulleys, and a patent spring-fastening in a deal-cased frame, with an oak sunk sill.

Other window-fittings.

3613. To fit up the windows of the intended two new committee-rooms, and of the two passages adjoining thereto, with inch deal linings and window-boards, with all proper backings and bearers, and to put all round the same neat mouldings 4 ins. girth.

Doors.

3614. To take down the door at present leading into the girls' school, and to repair thoroughly, and rehang the same in the entrance to the intended principal committee-room.

To fit up all the other intended doorways with 2-in. deal square-framed-doors; the folding doors are to be hung with three pairs of 4-in. butt-hinges, two long and very good brass flush bolts, and a best mortise-lock, with plain brass furniture; and each of the other doors is to be hung with a pair of 3½-in. butt hinges, and a best 7-in. iron-rimmed lock, with plain brass furniture.

Door-linings, &c.

3615. To put to all the new doorways 1½ in. linings, beaded and single-rebated, and to put round the same next the two intended new committee-rooms, neat mouldings 4 ins. girth.

Linings.

3616. To line with ¾-in. deal matched and beaded linings 4 ft. high all round the sides of the two intended new passages, and all along the North-side of the principal new cross-partition next the girls' school; the linings are to be fixed with proper ploughed grounds and backings, and are to be finished on the top thereof with large beaded capping.

3617. To skirt the intended two new committee-rooms, the North and East sides of the kitchen, and the intended new closet adjoining to the principal committee-room, with inch-deal 6 ins. high, fixed with ploughed grounds and the requisite backings.

3618. To fit up a dwarf-closet in one of the new passages by the general committee-room, with 1½-in. deal top, 1¼-in. framed and beaded front, 1¼-in. square framed door hung with a pair of 3-in. butt-hinges and a good tumbler-lock with a key; and to fit up the inside of the closet with three shelves and all proper bearers; to inclose the intended closet by the new Southern entrance to the boys' school with 1½-in. square framed partitioning, a four-panel 1½-in. square-framed door hung with a pair of 3½-in. butt-hinges and a strong 6-in. iron-rimmed dead-lock; and to put in the closet 25 ft. superficial of inch deal shelves fixed with all proper bearers.

3619. To provide and fix in the intended new kitchen a dresser with pot-board, drawers, shelves, and standards complete, value 4 guineas.

extra (See § 1071.)

y par- 3620. To form a temporary division of poles and tar-pawlings from East to West and the whole height of the story all across the boys' school, in order to partition off a portion of the same for receiving the girls while the work is being carried on in the one-pair story.

ork. (See § 1070.)

PLASTERER.

nd S. 3621. To lath, plaster, float, and set the ceilings and quartered-partitions of the intended two new committee-rooms, and the ceilings and quartered-partitions of the intended two new passages thereto.

3622. To lath, plaster, and set the new quartered-partitions on the sides thereof next the girls' school and the inside of the kitchen.

3623. To render, float, and set all the brick-work of the intended two new committee-rooms, and of the intended two new passages thereto.

3624. To stop and whiten all the new ceilings when the same are perfectly dry.

3625. To stop and colour when dry of such teints of stone-colour as may be directed, all the new plastering of the sides of the intended new committee-rooms and passages.

ting. 3626. To stop and lime-whiten twice all the brick-work of the intended new kitchen and the roof over the same and also the quartered-partition thereof.

PLUMBER.

3627. To lay on the water to the cistern in the intended new kitchen, with lead strong ¾-in. pipe, and ball-cock with boss and all other proper appertenances; to put to the cistern a good brass cock complete; and to put from the intended sink to the drain sufficient lead 2½-in. very strong waste-pipe and a large brass bell-grate.

PAINTER.

4 times in oil.

3628. To knot, stop, pumice smooth in every part thereof, prepare properly, and paint four times with the best oil-colour, all the new wood-work and iron-work of the intended two new committee-rooms and of the intended two new passages; and to paint in like manner all the other intended new wood-work and iron-work of the school-building.

Twice in oil.

3629. To prepare in like manner, bring forward properly, and paint twice with the best oil-colour, the windows and other old wood-works and iron-works of the intended new rooms and passages and all the other old wood-work and iron-work belonging to the school-buildings which will be damaged or affected by the intended alterations.

CHAPTER XXXVI.

A SPECIFICATION *for building and completely finishing fit for occupation a new* WORKHOUSE *in for the Parish of agreeably to the Working-drawings hereunder enumerated, and according to such further explanatory Drawings as during the progress of the work may be furnished by the Architect.*

Schedule of the Working-drawings herein referred to. (*See* § 986.)

1. Plan, &c., of the foundations and drains.
2. Ditto — — basement-story.
3. Ditto — — walls and floor of the ground-story.
4. Ditto — — ground-story complete.
5. Ditto — — one-pair-story complete.
6. Ditto — — walls and floors at the one-pair-story.
7. Ditto — — two-pair-story.
8. Ditto — — attic-story.
9. Ditto — — roofs.
10. Elevation of the Eastern front.
11. Ditto next the burial-ground.
12. Ditto next the court.
13. Section from South to North.
14. Ditto from East to West.

[redacted]

[APTER XXXVI.

BRICKLAYER.

ice, &c. to rict-surveyor, (See § 987.)

nove present next the al-ground. 3630. To take down dig up and remove the whole of that part of the burial-ground wall which lies upon the site of the west front of the intended new building, and to clean and stack up the sound bricks therefrom for the new work. (See § 3224, for observations relative to cemetery earth.)

re ground, out water, 3631. To shore and strut the ground about the buildings (while the foundation-works are being carried on) to bale out, draw off, or pump away, and remove, all water and soil which may come into or upon the foundations from springs currents drains cess-pools rain or otherwise; and to make good all damage accidental or otherwise which may occur during the laying of the foundations as well to the works of the intended new buildings as also to the neighbouring premises therewith connected.

ging, cartage, 3632. To cut away and remove all old brick-work and other impediments which may be found in the way of the new foundations; to dig out wherever requisite for the foundations, and works generally; to make up the ground in the manner shown by the sections and other drawings; and to cart away entirely all earth soil and other matters which will of necessity require removal in order to leave the ground and soil at the several levels shown by the drawings.

ng in ground, 3633. To fill in and consolidate by water the ground about the foundations when so directed by the architect; to fill in the trench next the burial-ground with earth screened fine: all the clay found in digging is to be laid against the basement external walls.

ibish, &c. (See § 989.)

air adjoining k-work. 3634. To repair the brick-work of all the adjoining premises wherever the same may be justly claimed by the proprietors thereof should any injury or necessary alteration be caused thereto by the new works.

To make complete to the new buildings, the ends of the cemetery-walls and the ends of the old dwarf-walls next the court, and to under-pin where requisite, repair, and point entirely with blue stone-lime coal-ash mortar, such of the old walls on the south side of the buildings as are shown by the plans as intended to remain.

eral brick- k. 3635. To execute all brick-work requisite for carrying into effect the design of the buildings according to the drawings and directions of the architect.

ies. (See § 2897.)

ged arches. 3636. To form all the lower external arches of the east front according to the drawings in gauged-work cut in a close and accurate manner, chamfered on the edge, and properly set.

Chimneys.

3637. To properly turn parget and core all the flues; to put to the fire-place of the kitchen, a brick fender 9 ins. thick and 15 ins. high in order to support the chimney-slab thereof; and to put to each of the other fire-places a 4-in. brick trimmer 18 ins. longer than the chimney-opening; to carry up in a neat manner the chimney-shafts according to the drawings with the upper four courses thereof cut and set in new quick Parker's cement.

Air-flues.

3638. To carry up in the buttresses and where else shown by the drawings air-flues to ventilate the buildings, and to set thereto the intended gratings and valves: the insides of the air-flues are to have the joints fairly struck.

Bedding, &c.

3639. To bed in mortar all the plates lintels bond-timber wood-bricks stone-work and all other things in or about the buildings which may so require, and to bed and point round with lime and hair mortar all the window-frames and door-frames.

Piers under kitchen and laundry floors.

3640. To build brick piers as shown by the drawings, for the support of the sleepers of the kitchen and laundry floors; each pier is to be in two courses 9 ins. square and two courses 9 ins. by 4½ ins.

Cross-walls.

3641. To lay 4½-in. brick cross-walls 3 courses high for the support of the paving of the kitchen, wash-house, and stair-case, and of the passages and lobbies of the basement-story.

Brick paving.

3642. To pave with hard stock-bricks laid flat, all the remainder of the basement-story (including the areas) which is not intended to be paved with stone.

Tile cresting, &c. in Parker's cement.

3643. To cope the back and inferior walls (not intended to have stone copings) with brick-on-edge and double plain tile cresting laid in and jointed with quick Parker's cement and Thames sand mixed together in equal measures.

Parker's cement stucco against basement walls.

3644. To stucco with pure quick Parker's cement one inch thick the whole of the outside of the brick-work above the footings round all the basement walls of every kind against which the ground will lie, and for 6 ins. above the ground.

Splays, &c.

3645. To cut and rub splays to the inside and the outside of all the openings of every kind throughout the buildings whether particularly shown by the drawings or not, and at all the other parts so requiring.

Drains.

3646. To form the drains as shown by the drawings; the lower half of each drain is to be set in new quick Parker's cement, the main drain is to be continued to the sewer in . and the contractor is to discharge all fees and expenses attendant thereon. To put to each of the twelve sink-stones, a large trap stuccoed all over with pure Parker's cement.

Bricks

3647. All the bricks (except those which will be taken from the cemetery-wall) are to be new approved, hard-burnt, square grey stock-bricks without any admixture of soft bricks, place-bricks, or other inferior bricks: the whole of the outside work is

to be faced in the neatest manner with hard picked stock-bricks of a bright and uniform colour.

Mortar.

3648. The whole of the mortar is to be compounded in the proportion of one third by measure of the very best Dorking stone-lime and two thirds by measure of sharp Thames sand.

Grouting.

3649. The whole of the brick-work is to be grouted at every alternate course thereof, particular care being taken not to stain the outer facings thereof.

Areas, &c. in Parker's cement.

3650. The 4-in. brick area-walls are to be set in new quick Parker's cement, as are also the upper courses of brick-work under the outer reveals and those forming the window-stools.

Mode of doing the work. (See §§ 359—365 & 1010.)

3651. No four courses of brick-work are to rise more than one inch exclusive of the bricks, all the external walls above ground are to be scrupulously carried up in Flemish bond throughout their whole thickness with all the heading-bricks carried through both withinside and withoutside in order to prevent excuse for the bad union of two different kinds of bonds: all the other brick-work is to be laid in manner of English bond; all the joints are to be neatly struck, and those on the outside of the work are to be drawn.

Reparation of accidents, &c. (See § 1111.)

3652. All the walls are to be built level and perpendicular except where otherwise particularly directed, and should any damage occur to the work by accident, settlement, or otherwise, during the time of building or within twelve calendar months thence after, the contractor is at his own expense to make the said damage good as shall be by the architect directed.

Lime-whiting.

3653. To lime-whiten twice the whole of the internal brick-work of the building (with the exception of the committee-room, the three rooms of the master and matron, and the arcade) and to lime-whiten in similar manner the insides of the basement-areas.

MASON. (See §§ 265—295.)

One course of Yorkshire stone in foundation.

3654. To bed for the foundations of all the principal walls, of the lengths and breadths shown by the drawings, a complete course of Yorkshire stone not in any part thereof less than 2½ ins. thick; and no stone whereof is to contain less than 5 ft. superficial; all the joints in the said stone are to be set close together in every part.

(*Note. The soil upon which this stone was laid was a firm clay, the building 50 ft. high, and after 8 years not the slightest symptom of settlement is discoverable in the work.*)

6 pieces of granite under iron binders.

3655. To put at each end of the three iron binders a piece of granite curb-stone at least 7 ins. thick and containing 3 ft. superficial.

Yorkshire stone plinth strings, &c. (For observations upon Yorkshire stone see § 1014. The frost of eight winters has proved that the stone here used, though the best of its kind, was neither economical nor handsome)

3656. To put all round the building at the commencement of the buttresses and also at the bottom of the Eastern front, a covering to the plinth, formed of 3-in. Yorkshire stone 9 ins. wide, rubbed, and between the buttresses chamfered on the top; the parts thereof set raking to the gables over the three West windows, and the parts thereof over the arcade are to be 12 ins. wide, and are to be wrought and throated as shown by the drawings; the parts thereof at the two corbeilled chimney-stacks, and round the two closet-towers, are to be of profile similar to that last described, but with no extra width. To put round each of the two closet-towers also two upper strings of 3-in. Yorkshire stone, one thereof 9 ins. wide, the other thereof 12 ins. wide.

To put over the 4 small gables, finials of Portland stone according to the drawings.

To put to the two large chimney-stacks also a lower string similar to that level with the top of the plinth.

To put to each of the small chimney-stacks against the two tower buildings, a corbeille of 3-in. Yorkshire stone 18 ins. wide and of the whole length of the salient work.

Tablets.

3657. To put two shield-tablets for inscriptions as shown by the drawings, each of Portland stone 6 ins. thick and secured by four 9-in. copper cramps.

Yorkshire stone window-sills.

3658. To put to all the windows, sills of 2-in. Yorkshire paving 11 ins. wide, laid sloping, wrought fairly, and with tooled soffits and ends, and level tops beneath the sash-sills.

Copings.

3659. To finish all the parapets and gables and the dwarf walls of the arcade with Yorkshire stone coping 13 ins. average width, throated and chamfered next the front, and plugged with lead at all the joints therein; the raking parts of the coping are to be cramped with strong copper cramps to pieces of Yorkshire bond-stone carried up in the brick-work behind the same.

Yorkshire stone under dormer-windows.

3660. To put under each of the six Eastern and Western attic dormer-windows a piece of 3-in. Yorkshire stone 5 ft. long and 2 ft. wide, under which the brick-work is to be corbeilled out to support the brick jambs of the dormer-windows.

4 in. Yorkshire stone floors to water-closets and sink closets.

3661. To form all the floors of all the water-closets and sink-closets of 4-in. tooled Yorkshire stone landing, tailed all round at least 4 ins. into the brick-work, and cut out where needful for the pipes and other necessary appertenances; all the landings are to be laid with currents, and are to have channels cut 3 ins. wide to carry off any wet that may fall thereon: these landings are to have no joints therein, but are to be each in one piece, and the ends next the stair-case landings are to be tooled fairly.

Floors to 3 store-rooms, to arcade, to lobbies, and to stair-cases, on the ground story.

3662. To form the floors of the 3 store-rooms, of the arcade, of the lobbies, and of the stair-cases, all on the ground-story, of the best hard compact 4-in. Yorkshire stone landing joggled and run with lead.

CHAPTER XXXVI.

Seven sinks of Yorkshire stone.

3663. To put seven sinks of Yorkshire stone 7 ins. thick, of the sizes and in the situations shown by the drawings: each sink is to be securely fixed with the requisite bearers, and is to have a hole cut therein to receive the waste-pipe and grating.

External steps.

3664. To form the three flights of external steps, according to the drawings, of the best tooled and compact and solid Yorkshire stone with 4-in. tooled landings, and properly back-jointed.

2½-in. Yorkshire stone paving to basement story.

3665. To pave with 2½-in. Yorkshire stone, laid in regular courses, the wash-house, the basement-passages, and the basement-lobbies, and also that part of the kitchen which is not intended to have boarded-flooring; the steps in the basement-passage are to be formed properly with risers in the paving.

To provide and fix in the pavings of the basement, and in that of the areas, twelve five-hole sink stones, each sunk out of a piece of Yorkshire stone 15 ins. square.

4 Portland stone chimney pieces and slabs.

3666. To put to the fire-places of the committee-room and of the master's and matron's three rooms, 1½-in. Portland stone chimney-pieces and slabs, each jamb thereof 6 ins. wide, each mantle thereof 8 ins. wide, and cut out to the figure of a Gothic arch, and each shelf thereof 7 ins. wide; the whole of the jambs mantles and shelves, chamfered at all the edges thereof, and the chimney-slabs, each 2 ft. wide, and 18 ins. longer than the chimney-opening.

Yorkshire stone hearths and slabs.

3667. To put to each of the other fire-places throughout the buildings, a slab of 2½ ins. Yorkshire stone, 2 ft. wide and 18 ins. longer than the chimney-opening; and to put to each chimney throughout the buildings a back hearth of 2½-in. rough Yorkshire stone.

Repair old paving.

3668. To make good the public pavings, or to pay to the commissioners of paving the expense thereof; and to relay and make good to the new buildings, the present paving of the court-yard.

Cutting out and cleaning off work.

3669. To cut such holes, rebates, fair-edges, throatings, and channels, and to perform such other work and labour to the stone-work as may be proper and requisite for the perfect completion of mason's work.

3670. To clean off in the spring of the ensuing year, the whole of the stone-work; and to remedy to the satisfaction of the architect all such defects as may appear in the stone-work, from frost or otherwise, after the winter of A. D. —— (three years afterwards.)

Quality of stone, &c.

3671. The whole of the stone is to be hard compact weather-proof, and of approved quality, and is to be free from shakes, vents, flaws, and all other defects.

30 ft. additional Yorkshire paving.

3672. To provide and fix under the contract 30 ft. superficial additional of 2½ in. Yorkshire stone, for corbelling out the brick-work, and for such other purposes as may be by the architect directed.

(The windows of this building were executed with label-mouldings of stone, and the description of window-heads mentioned in § 592, though they are not here so described, and after eight years there is not the least appearance of settlement in any one of them.)

SLATER. (See §§ 542—3.)

3673. To slate with the best countess slates, nailed with copper nails, and pointed inside with lime and hair mortar, and also with proper similar bond in every part thereof, and with cut headings against the ridges, the whole of the two large upper roofs, and the roofs over the two dead-houses; and to repair thoroughly all defects caused by workmen or others, and to leave finally the whole of the slating in perfect order.

CARPENTER AND JOINER. (See §§ 337—40.)

New materials. (See § 1029—30.)

Timbers and deals. (See § 1031—2.)

None of the joists, rafters, ceiling-joists, or quarters, are to be respectively more than 11½ ins. apart.

Hoard. (See Index.)

Bond-timber. 3674. To put all round in the internal brick-work of each story above the basement, two complete tiers of fir bond-timber, 4 in. by 2½ in. without joint, except at the angles thereof.

Wood-bricks, &c. (See § 1041.) 3675. To put wood-bricks for fixing such few finishings as may so require; and to put over such door-ways in the brick-work as have not door-cases, lintels of fir 4 ins. high, 15 ins. longer than the width of the opening, and as wide as the thickness of the brick-work.

Centering, &c. (See §§ 1141.) 3676. To provide, fix, ease, and finally remove when so directed, centering sufficient for all the openings gauged, and rough-arches, counter-arches, recesses, trimmers, and other parts of the buildings requiring the same: and to shore up the ground, and the adjoining buildings more particularly during the laying of the foundations.

Casing to stone-work. 3677. To case up the whole of the stone-work in order to preserve the same from injury during the carrying on of all the other works.

Plates. 3678. To put to the cross-walls separating the basements and to the whole of the floors of the one-pair story, two-pair story, and three-pair story (except where the chimney-flues occur) fir wall-plates scantling 5½ ins. by 4 ins. without scarfings but with double notched halvings at the angles thereof.

[redacted]

...PTER XXXVI.

to part of story.

3679. To put to the large hall, fir joists scantling 7 ins. by 2 ins. corked down and shouldered upon the iron binders.

to the re- r of -story and stories.

3680. To put to the remainder of the ground-story, and to the one-pair story, two-pair story, and three-pair story, joists scantling 11 ins. by $2\frac{1}{4}$ ins., and trimmers and trimming-joists 11 ins. by $2\frac{3}{4}$ ins.: the joists of the floors of the whole of the six large wards in the Eastern and Western wings are to be strutted between in two lines to each floor with herring-boned fillets.

and sleep- basement.

3681. To put to the centre part of the kitchen-flooring and to the flooring of the laundry, oak joists and sleepers scantling 4 ins. by $2\frac{1}{2}$ ins.

d-floors.

3682. To lay the floors of the basement and ground stories, and of all the remainder of the buildings, with $1\frac{1}{4}$ in. yellow deal straight-joint half-boards listed entirely free in every part thereof from the least sap-wood.

of porch.

3683. To cradle the ceiling of the front porch over the steps with $1\frac{1}{4}$ in. deal 3 ins. wide.

g.

3684. To skirt the committee-room and the three rooms of the master and matron, with inch chamfered and rebated deal $6\frac{1}{2}$ ins. high plugged to the walls.

To skirt all the other parts of the buildings having boarded-floors with inch deal 2 ins. wide laid flat upon the floors and scribed to the walls.

rs, &c.

3685. To put to the basement-story where shown by the plans oak solid wrought framed rebated and chamfered window-frames.

To put to the attic story and to the ground story (the front East lower windows excepted) similar window-frames, but of fir all except the sills thereof, and with heads as shown by the drawings.

To put to all the other openings both internal and external as shown by the drawings, proper deal cased-frames with oak sunk sills (the sills of the internal windows which are to be of fir, only excepted) brass axle-pulleys, large patent lines and iron weights; to put to all the window-openings within and without the premises (those to the large hall only excepted) $1\frac{1}{2}$ in. chamfered-bar sashes, double-hung with the best spring-fastenings to the cased-frames, and hung as casements with 3 in. rising butt-hinges to the solid frames, and with two good bolts to each, but to be fixed over the doors and in the closets where they are merely intended to give light: to put over the two large dormer-windows, and also between the two tower-buildings wood-dressings and parapets according to the drawings.

3686. To form the two roofs over the Eastern and Western wings with curb-plates $4\frac{1}{2}$ inches by 6 ins. wrought externally, wrought ties 10 ins. by $2\frac{1}{2}$ ins., eight wrought angle-ties each 7 ft. long, and scantling 6 ins. by 3 ins. rough fir rafters 6 ins. by 2 ins. ridges and hips rounded for lead $10\frac{1}{2}$ ins. by $1\frac{1}{4}$ in., curb-rafters $4\frac{1}{2}$ ins. at top and $5\frac{1}{2}$ ins. at bottom by $3\frac{1}{2}$ ins., wrought and cham-

fered, and with cut Gothic blocks filled in between at the heads thereof, in order to form Gothic panelling externally.

3687. To board the curb-rafters within side with ¾ in. yellow deal tongued and wrought next the rooms; and to put to the upper rafters the requisite slate-battens of ¾ in. yellow deal 2¼ ins. wide.

3688. To put to the two dead-houses lean-to roofs with plates 4 ins. by 4 ins., rafters 4 ins. by 2 ins., and slate-battens as to the other roofs.

3689. To cover the remainder of the buildings, with joists 8 ins. by 3 ins., wrought and laid with inch yellow deal tongued boarding for lead, upon plates 6 ins. by 4½ ins.; to put curb-rafters and plate finished with Gothic blocks, and boarding on the side next the court-yard, as described to the other roofs.

Gutters.

3690. To form the gutters as shown by the drawings, with 2½ in. rebated drips and currents 1½ in. to every 10 ft. lineal, inch yellow deal gutter-bottoms, and strong yellow deal bearers.

Dormer.

3691. To form the dormer-head to the steps leading to the roofs, with quarters 4 ins. by 2½ ins., and posts and plates 4 ins. by 4 ins., and to batten the sloping part thereof for slates with 3-in. deal; to cover the cheeks and flat head with inch deal, and to put thereto a ¾-in. ledged trap-door, with stops, hinges, fastenings and fittings complete.

Door-cases, &c.

3692. To put to all the door-ways (those in the deal partitions and closets only excepted), fir door-cases framed, wrought, and chamfered, scantling 5 ins. by 4 ins.

> 3693. *Door-cases are much more sound and proper for this kind of buildings than jamb-linings, and they render wooden lintels unnecessary: but the substitution of stone blocks for the hinges and locks of the doors is still better; in the latter case the bricks of the jambs would require to be rebated, which were building in wholesome condition, might be formed in the clay before the bricks were burnt, and would cost scarcely any thing. There is now to be seen at Eastbury, near Barking, in the county of Essex, an example almost wonderful, of a recessed half-handrail in a winding stair-case, showing of what brick-work is capable: the countless examples of fine* ARCHITECTURAL *brick-work, in that and in other alluvial counties, shows how indomitable were our ancestors, even where nature seemed to have denied them the materials of good structure, and their instances of success are as numerous as the modern instances of meanness and vulgarity to be found in the same counties.*

3694. To put 1¼ in. plain linings to such of the doors as have not door-cases.

Doors, &c.

3695. To put to the whole of the buildings 1½-in. deal four panel doors framed square, except the front entrance-door, which is to be bead-flush and square and to be 2 ins. thick; the door

leading from the inner lobby to the committee-room is to be hung in two heights; the nine doors of the entrance-hall and of the two waiting-lobbies therewith connected, and also the doors of the kitchen, scullery, laundry, wash-house, and master's and matron's chambers are to be sashed; the front pair of doors and the door next the arcade are to be sashed, and to have 1¼-in. bead-flush and square shutters with dogs and thumb-screws; each door is to be hung with a pair of 4-in. butt-hinges; the two outer doors of the ground story are to have each a best 10-in. draw-back iron rimmed lock with plain brass furniture, and two 10-in. bright barrel bolts; all the other doors are to have each a 7-in. best iron rimmed lock with plain brass furniture; those to the closets are to be without handles.

l-cellar boards. 3696. To put to the coal-cellar door a stack of 1¼-in. coal-boards 5 ft. high moveable in proper slides.

titions. 3697. To divide off and inclose the committee-room, the master's and matron's room, the three store-rooms, and the lobbies therewith connected, by partitions board and braced, alternately with ¾-in. deal planks and styles of 1½-in. deal 2½ ins. wide, grooved and chamfered, and fixed in grooved and chamfered bottom rails 8½ ins. wide, top-rail 6½ ins. wide, grooved chamfered and cut to show flat gothic arched heads over each division of the partitions.

sets, &c. 3698. To put to all the other parts of the building, where shown by the drawings, 2-in. deal square framed partitions; the whole of the closet-doors and other doors are to have beaded and rebated styles and heads; and the doors are to be rebated also to form stops. To put round three sides of each of the closets throughout the buildings, four tiers of shelves of inch deal 12 ins. average width, with all requisite bearers.

arf closets. 3699. The two dwarf closets in the master's and matron's living-room, are to have 1¼-in. fronts and doors, inch wainscot tops, one tier of shelfing, and locks hinges and flush bolts.

ter-closets. 3700. To fit up all the water-closets, with seats risers and clamped flaps and frames of 1¼-in. deal; each flap is to be hung with a pair of 3-in. brass butt-hinges; to provide and fix all proper bearers; and to attend the plumber, and to cut out for the basins, cocks, &c.

terns. 3701. To complete the twelve cisterns on the roofs according to the drawings, with cases of 2-in. deal where the flats and brick-work do not already form the same; and to put thereto all requisite fillets struts bearers and springers; the cisterns are to be 2 ft. deep.

tters, &c. 3702. To put to the committee-room and to the master's and matron's room 1¼-in. deal clamped flap-shutters, hung folding with rule-joints strong hinges mitred oak bars and 1¼-in. rounded linings.

sers, &c. 3703. To put in the kitchen, a dresser of the size shown by the basement-plan with 2-in. deal top, four sunk shelves of inch deal 9 ins. average width, three cut standards of 1¼-in. deal, two

large drawers, framed legs and rails, and inch pot-board on proper bearers. To fix in the scullery a table-top as a dresser of 1¼-in. deal with proper framed legs and bearers.

Sundries.

3704. To put to the angles of the chimney-breasts of the committee-room and of the three rooms of the master and matron, rebated angle staff beads; to cover each of the projecting chimney-fronts with a shelf of 1¼-in. deal; to provide all requisite rods rules moulds and patterns, and to provide and fix all requisite and proper beads, stops, linings, fillets, tilting-fillets, springers, and blocks; and to perform such rebating, tonguing, grooving, scribing, and such other works and labour as may during the progress of the works be found requisite for completely finishing the building and its offices and its appertenances; and to fix all the smith's work and ironmongery of every kind connected with the carpenter's and joiner's works.

20 ft. cube fir extra.

(See § 1071.)

Stair-cases.

3705. To erect the stair-cases according to the drawings, with 1½-in. oak treads, 1½-in. oak feather-tongued half-paces, 1¼-in. yellow deal risers, very strong fir bracketed carriages, 1½-in. deal string-boards and wall-strings, strong framed and chamfered newels, deal framed balusters 1¼ in. square, oak rounded hand-rails 4 ins. by 3 ins., all requisite inch deal apron-linings iron stays and other fittings of every kind.

The upper landing of each story of the stair-cases is to be the same as described for the floors, with joists 5 ins. by 2 ins.

Dormer ladder.

3706. To put to the dormer a strong framed step-ladder.

SMITH.

Cast-iron wall-plate. (See §§ 324 and 1182.)

3707. To put all round the walls of the ground-story a cast-iron wall-plate 3 ins. by 1½ ins., dovetailed together at all the joints.

Three cast-iron binders.

3708. To put three cast-iron binders for the support of the ground-flooring according to the drawings, properly corked down upon the iron wall-plate, and of average scantling 12 ins. by 2 ins.

Iron cradle to chimneys of master's and matron's chambers.

3709. To put for the support of the chimneys of the master's and matron's chambers a cast-iron cradle weight not less than 336 lbs.

Chimney-bars.

3710. To put to each of the fire-places a chimney-bar of wrought-iron 3 ins. by ½ in., properly corked and bent to the figure of a gothic arch.

5 cwt. of ties, &c. (See § 1703.)

3711. To provide and fix 560 lbs. avoirdupoise of iron in such ties, straps, bolts, screws, and other light wrought and hammered work as may be by the architect directed.

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[APTER XXXVI.

e cast-iron in basement.

3712. To put in one of the bull's-eye openings in the basement-story, three cast-iron bars 1 in. square and 2 ft. 6 ins. long.

gratings. § 1333.)

3713. To provide and fix cast-iron area-gratings according to the drawings with rims 1¼-in. square, bars not more than 1¼ in. apart, 1¼ in. by ¼-in., extra bearers 1 in. by 2½ ins., and dogs to extend under the paving.

3714. To put above each area grating a panel of cast-iron with frame one inch square, filled in with bars 1¼ in. by ¾-in. not more than 4 ins. apart, and strong fangs to be built into the brick-work; the large grating in the court is to be formed so as to serve as the two lower steps to the arcade.

tre-feuille ings to air-s.

3715. To provide and fix No. 53 ornamental cast-iron gratings ½-in. thick and 12 ins. square according to the drawings, each with four fangs, to be built into the brick-work at the external orifices of the air-flues for ventilating the buildings; and to provide and fix also 50 cast-iron rebated frames 1¼ in. by ¾-in. each with four fangs to be built into the brick-work at the bottoms of the air-flues, and each with a light cast-iron door or valve to open or shut horizontally within the building upon centres and with turn-buckles thereto.

t. iron ping.

3716. To provide 560 lbs. avoirdupoise of wrought-iron hooping to be laid in the brick-work as bond, particularly near the air-flues.

-iron barge to ner-windows.

3717. To provide and fix three pairs of ornamental pierced barges, as shown by the drawings, for the small gables over the three Eastern dormer windows each pair to weigh 28 lbs. at the least.

nel-pipes. § 1101.)

3718. To put from the roofs to the drains, two complete stacks of 6-in. cast-iron funnel-pipe with large Gothic heads fixed complete and cut out where requisite for the various waste-pipes.

-iron sashes.

3719. To put to the whole of the windows of the large hall, cast-iron sashes as light as the same can with convenience be made, with bars to receive diagonal diamond squares about 10 ins. high and 6 ins. wide; and each window is to have a strong casement hung on centres therein, and fitted up with fastening lines pulleys and other proper appertenances complete.

-plate.

3720. To provide a strong cast-iron plate for covering the shoot to the coal-cellar, with fastenings complete.

PLASTERER.

. S. and W.

3721. To lath, plaster, set, and whiten ceilings, and strings to the whole of every story of the buildings, except to the two reception-wards, to the water-closets, and to the sink-closets, and except also to the arcade, and to the front porch: the greatest care is to be taken that the angles of the ceilings be straight, but

they will not be required to be floated, except the joists be irregular.

Parker's cement.

3722. To execute in Parker's cement jointed at every 9 ins. in height, and coloured to imitate stone, the sides of the committee-room, and the sides of the master's and matron's living-room ; and to lath, lay, and execute in like manner the ceilings of the arcade, and of the front porch.

3723. To form to all the other fire-places, chimney-pieces in Parker's cement stucco, to correspond with the four stone chimney-piece.

(These were so done for imagined economy, but were immediately after replaced by chimney-fronts of cast-iron.)

Render set and colour.

3724. To render, set, and colour the sides of the master's and matron's chambers.

PLUMBER.

6½ lb. milled-lead to gutters, flats, and cistern-bottoms.

3725. To lay the gutter-boards, flats, and cistern-bottoms with milled-lead weight 6½ lbs. to the foot superficial, turned up at least 8 ins. on every side *(see the carpenter's work)*, the flats laid with rolls not more than 2 ft. 3 ins. apart, and the lead of the flats and gutters dressed quite over the wood parapets of the curb roofs.

4 lb. milled-lead flashings.

3726. To put round the gutters, flats, and cisterns, 4 lb. milled-lead flashings 6 ins. wide.

5 lb. milled-lead step-flashings.

3727. To put to the ends of the roofs, raking step-flashings of 5 lb. milled-lead 13 ins. average width, with the requisite additional width between the chimney-shafts.

5 lb. milled-lead to dormers and cistern-sides.

3728. To cover the head and sides of the stair-case dormer, the heads of the eight dormer-windows, and the sides of the twelve cisterns with 5 lb. milled-lead.

Waste-pipes, &c.

3729. To put from each sink a strong lead 2-in. waste-pipe with a large brass bell grate thereto.

Water closets. (*See Index.*)

3730. To put to each of the water-closets a cast-iron basin, with a trap formed thereto, and with a large pipe leading to the iron-funnel ; to lay on the water from the cisterns to each basin with a cock having a brass drop-handle to each.

Lead to door cases.

3731. To put at the foot of each door-post in the basement-story a piece of 4 lb. milled-lead 15 ins. square, and to dress the same round the wood-work, and nail the same at the top thereof by strong copper nails.

4 cwt. extra lead work.

3732. To provide, lay, and fix 448 lbs. avoirdupoise in addition, of milled-lead in such extra works as the architect may direct, but the value of the whole or any part of which is however to be deducted if not required. (See § 2741.)

[redacted]

APTER XXXVI.

cast-iron s'-guttering.

3733. To put at the eaves, &c. of the curb-roofs 4 in. cast-iron guttering securely fixed on very strong brackets.

milled-lead ring to curb-

3734. To cover the curbed fronts of the attic-story at the sides of the dormers with milled-lead weight 5 lbs. to the foot superficial, laid in level courses and wrapped round the chamfered quarters or curb-rafters, formed to appear like Gothic panelings; and to put a 4 lb. milled-lead flashing 14 ins. wide along at the bottom of each curb-roof turned down over the coping.

milled-lead ps and ridges.

3735. To cover the hips and ridges with 4 lb. milled-lead 16 ins. wide, properly secured by lead-headed nails.

PAINTER.

times in oil on-work.

3736. To cleanse effectually from all rust, and to paint three times with red-lead colour, and twice in common colour, the whole of the iron-work of every kind throughout the buildings and their appertenances.

times in oil ood-work, &c.

3737. To prepare properly, knot, stop, and paint four times with the best oil-colour, the whole of the wood-works usually painted, and also the lead covering of the curb-roofs; the sashes are to be finished dark purple-brown; the front door is to be grained extra in imitation of oak, and is to be twice varnished with copal varnish.

GLAZIER.

3738. To glaze the windows and lights of the ground-story with good second Newcastle crown glass; and to glaze all the other windows, sashes, and lights throughout the buildings, with good third Newcastle crown glass: the whole of the glazing is to be properly bedded, bradded, and back-puttied, and is to be left clean and perfect at the completion of the other works.

CHAPTER XXXVII.

SPECIFICATION FOR WORKS *to be done according to a set of Drawings (signed with and forming part of the Contract) for M*
in the construction of a COURT OF ALMS-HOUSES *on a plot of freehold ground situate*

(Here to follow a list of the Working-Drawings, see § 986. *)*

(This specification was composed for a metropolitan situation: the adopting of it for buildings in an open situation will occasion little beyond the necessity of expunging some of its provisions.)

BRICKLAYER.

(See § 987.)

Notices, &c. to District-surveyor, &c.
Pulling down old materials, &c. (See § 1091.)

3739. To take down all the old buildings on the West side of the court; to take down carefully the Southern party-wall, the chimneys, the roof and the front-wall of the house at the North-east corner of the ground-plot; and to break up and remove all the old foundation-walls, and the other brick-work which will require to be taken away in order to perform the intended works.

3740. To clean thoroughly and to stack up for use such of the old bricks as may in the judgment of the architect remain sound unperished and fit to be again used, and to remove and cart away immediately from the premises all the other old bricks and all the other old materials herein directed to be taken down and not to be again affixed to the premises.

Digging, &c.

3741. To clear away from the site of the intended works, all impediments, and to excavate the ground for the basements, the cellars, the foundations, the areas, the cess-pools, the drains, the floors, and all the other works which may so require.

3742. To render level and hard the bottoms of all the trenches; and to fill in and consolidate properly the ground about all the footings, basement-walls, drains, and other works; and generally to work, fill up, remove, and level, the ground in and about the intended new works and the site thereof as shall be found requisite.

3743. To remove and cart away from the site of the intended works, all the superfluous earth ground and rubbish; and to leave [illegible] the whole of the intended dwelling-houses and premises [illegible] therefrom.

3744. To under-pin in the most careful and skilful manner, [illegible] best new hard stock-bricks set in new quick Parker's [illegible] clean Thames sand mixed together in equal measures.

all the walls and foundations of the buildings adjoining all round to the site of the intended new houses, wherever the same will be undermined or otherwise injured by excavating the ground in order to place other walls against the same: and to under-pin repair and make good and complete in like manner such of the walls as will join to the intended new buildings and premises without having other walls built against the same.

ng, &c.

3745. To rake out all the mortar from the joints one inch deep, to colour, and to flat-joint-point with stone-lime blue coal-ash mortar, all the exposed old external walls adjoining to and towards the site of all the houses; and to make good and complete in a substantial, neat, and workmanlike manner all the adjoining brick-work which will be injured, cut, or rendered incomplete by the execution of the intended works.

al brick-

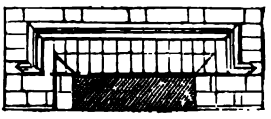
3746. To execute in the very best, most careful, and accurate manner, all brick-work requisite for carrying into effect the design of the intended dwelling-houses, with the offices and appertenances thereof, and including the new front-chimneys and the other requisite new brick-work to the house at the North-eastern part of the site, according to the drawings, and so as to render the whole premises complete and finished in every respect.

s, cradle- &c. (See §§ 70—94.)

3747. To put to the doorways and to such of the windows and recesses as are not intended to have flat heads, the very best gauged-arches, according to the drawings, and formed of hard bricks accurately cut and properly set.

3748. To put to each of the flat-headed windows a cradle-bar of wrought-iron 2½ ins. by ½ in. chamfered on the outer edge thereof so as not to be visible, cambered slightly, 2 ft. longer than the window-opening, and covered all over with melted pitch.

3749. To put above the intended iron cradle-bars over the flat-headed windows, arches composed of bricks set upright thus, chamfered, rubbed, and neatly set.



3750. To put to all the remainder of the openings, uncut arches properly turned and neatly tuck-pointed on the outside.

gs. (See §§ 50 and 867.)

3751. To face all the external brick-work of the buildings with the very best hard malm paving-bricks of a bright uniform colour, finished in the neatest possible manner with flat joints accurately drawn.

ets.

3752. To finish the parapets above the doorways and the parapet of the house No. 1 with projecting heading-bricks 9 ins. apart, and chamferings in brick-work according to the drawings.

neys.

3753. To properly turn, parget, and core all the flues; and to put to each fire-place a chimney-bar of wrought-iron 2 ins. by ⅜ in. properly corked at the ends thereof.

3754. To put to each of the fire-places a 4-in. trimmer of brick-work.

3755. To carry up all the chimney-shafts according to the drawings, those of them next the front walls having their bases and heads rubbed and set in Parker's cement and clean Thames sand in equal measures with double plain tile cresting, brick flat, and tile flanchings, and with a first sized chimney-pot over each flue.

Tile-cresting, &c. Parker's cement, &c.

3756. To finish all the walls which are not intended to have stone copings with double plain-tile cresting and brick-on-edge, both set in and jointed with new quick Parker's cement and clean Thames sand mixed together in equal measures.

Indents, &c.

3757. To cut and parget proper perpendicular indents in the old brick-work where requisite for receiving the intended new brick-work; and to make good in a workmanlike manner all damage which may be caused by cutting the indents.

Other cuttings.

3758. To cut and rub splays to the reveals, quoins, plinths, and other parts of the intended buildings according to the drawings.

3759. *If work be executed in the country, moulded plinth-bricks may be frequently obtained, which are cheaper, harder, and more sightly than cut bricks.*

Bedding.

3760. To bed in mortar all the bond-timber, plates, lintels, wood-bricks, templets, and other work so requiring; to bed and point round with lime and hair mortar, all the door-frames and window-frames; and to back up with solid brick-work to all the timbers, stone-work, and other things to be set in the brick-work.

Piers.

3761. To build for the support of the sleepers of the basement-floors, the requisite brick-piers, each in two courses of work 9 in. square, and two courses of work 9 ins. by 4½ ins.

Brick paving.

3762. To pave with hard stock-bricks laid flat in mortar, and grouted also between the joints with liquid mortar, the whole of the intended seven coal-cellars.

Cess-pools, drains, &c. (See §§ 1001—4.)

3763. To construct under the most Northern privy, a cess-pool 4 ft. 6 ins. internal diameter, and 20 ft. deep, steined round with brickwork 4 ins. thick, of hard stock-bricks, the upper four courses of work being set in equal measure of new quick Parker's cement and clean Thames sand, and the remainder thereof being laid dry: to put under each of the other privies, a cess-pool, 2 ft. 3 ins. internal diameter, and 10 ft. deep, steined round with work 4 ins. thick of hard stock-bricks, wholly set in equal measures of Parker's cement, and clean Thames sand.

3764. To put from the several smaller cess-pools to the large cess-pool, barrel drains of hard stocks 12 ins. internal diameter, set in mortar, and rendered over the lower half thereof, ¾-in. thick, with the best new quick pure Parker's cement; and to put from each privy to the cess-pool beneath the same, a proper easy

shoot and a funnel set in and rendered ¾-in. thick, with pure Parker's cement.

10 cwt. iron hooping.

3765. To provide and work up in the chimneys and other brick-work, as the architect shall direct, 10 cwt. of wrought-iron vat-hooping.

Two rods extra brick-work.

(See § 1007.)

Bricks.

(See § 1008.)

Mortar.

(See § 1009.)

Mode of doing the work. (See § 1010.)

3766. The whole of the brick-work (except where herein otherwise directed) is to be laid in and to be entirely flushed up at every course thereof with mortar, and is to be grouted completely with liquid mortar at every second course of work more than 9 ins. thick, great care being taken not to stain the outer faces; no four courses of work are to rise more than one inch besides the height of the bricks; every part of the brick-work is to be carried up both within and without, in manner of English bond; and all the internal work not intended to be plastered is to be finished quite fairly, and is to have the joints thereof neatly drawn.

Lime-whiting.

3767. To lime-whiten twice the internal brick-work of the cellars, and of the yards and privies.

Scaffolding.

(See § 2664.)

Jobbing-work.

3768. To perform to the dwelling-houses, and to the offices and appertenances thereof, all such bricklayer's work as may be requisite thereto in the nature of jobbing.

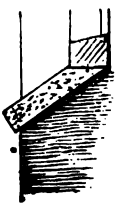
MASON. (See §§ 265—295.)

Label-mouldings.

3769. To put to the windows and wherever else shown by the drawings, label-mouldings of the best hard Portland stone 6¼ ins. by 4½ ins. with solid mitred knees.

Window-sills. (See § 1014.)

3770. To put to all the front windows above the basement-story, sills of 2-in. Yorkshire stone 10 ins. wide, wrought with fair tooled edges and ends, and laid sloping; to put to the windows of the basement-story, sills of 2½-in. Yorkshire stone 16 ins. wide, wrought with fair edges and throated.



3771. To put to all the other windows of the five houses, sills of 2½-in. Yorkshire stone 9 ins. wide, wrought with fair edges and ends, throated, and laid sloping.

Tablets.

3772. To put over each of the five principal external doorways, a tablet of Portland stone 4 ins. thick, wrought to the form

of a shield, chamfered on the edges thereof, and with a number cut thereon.

3773. To put at the Southern end of the court, a tablet of Portland stone 4 feet long, 2 ft. 8 ins. high, 6 ins. thick, chamfered on the edges, secured by four strong copper cramps extending quite through the wall and clinched on the inside of the buildings, and with an inscription stating the name and the date of the erection of the court cut thereon in the very best manner.

Cornices, &c.

3774. To provide and fix to the parapets gables and other parts of the five houses, cornices and string-courses of the best hard Portland stone, of the sizes and profiles shown by the drawings, channelled and run with lead at the joints therein, and with solid quoins mitres and finials.

Copings.

3775. To finish the parapets and gables and the battlements and embrasures with moulded water-tablings, according to the drawings, of the best hard Portland stone, channelled and run with lead at the joints therein, with solid mitres and quoins, and the other parts of the copings being sawn out of blocks scantling 13 ins. by 8 ins. each block producing two pieces of coping.

Corbeilles.

3776. To provide and fix three moulded corbeilles of the best Portland stone, wrought according to the drawings; the two corbeilles under the South chimney-shafts are to be each composed of a piece of stone 1 ft. 10 ins. high and 2 ft. square, and the corbeille between the two South doorways to be composed of a piece of stone 1 ft. high and 1 ft. 4 ins. square.

Yorkshire stone coverings to two stair-cases and four privies (or of Portland stone.) See § 3201.)

3777. To cover each of the two Southern stair-cases with a single piece of the best hard and well-compacted Yorkshire stone full 3 ins. thick, tooled on the upper side, throated and rubbed on the under side to form a ceiling, laid with proper currents, and with smoothly rubbed water-channels as shown by the drawings; and to cover each of the four external privies with similar stone with the requisite pipe-holes cut therein.

Yorkshire stone coverings to cellars.

3778. To cover over all the cellars and the other part of the court, as shown by the drawings, with the very best hard and well-compacted landings of Yorkshire stone 4 ins. thick, forming also paving to the court, in only 20 pieces, tooled on the upper side thereof, joggled and run with lead so as to have the joints thereof water-proof, laid with proper currents, with rubbed water-channels; and to cut out and rebate the said stone landings for the reception of the area-gratings and coal-plates.

Gratings and coal-plates. (See § 1333.)

3779. To provide eight area-gratings according to the plan, of cast-iron with frames 1 in. by $1\frac{1}{4}$ in. and feather-edged bars average 1 in. by $\frac{3}{4}$ in. and not more than $1\frac{1}{2}$ in. apart; and to fix the whole thereof by running the same with lead into the Yorkshire stone.

And to provide seven strong cast-iron plates or covers for the coal-shoots with proper fastenings thereto.

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Yorkshire stone steps.

3780. To provide and fix at the several front and back external door-ways of the five houses, steps of the best solid hard and well-compacted Yorkshire stone, scantling 13 ins. by 7 ins., properly back-jointed, with the projecting corners canted off, and mortised out to receive the feet of the door-posts.

Yorkshire stone paving.

3781. To pave with the very best Yorkshire stone not less than 2½ ins. thick in any part thereof, the whole of the yards and privies; and to provide and bed and fix where directed, 40 feet superficial of other similar Yorkshire stone paving.

Chimney-pieces, &c.

3782. To put to the several fire-places of the houses, jambs mantles and shelves, each of the best 1¼-in. Portland stone chamfered on the edges thereof, the shelves 7 ins. wide, and all the jambs and mantles 5 ins. wide.

To put to all the fire-places, hearths of 2½-in. Yorkshire stone, and slabs of the best 2-in. Portland stone 18 ins. wide.

Sinks and sink-stones.

3783. To put to each of the houses a sink in the situation shown by the drawings, of 6-in. Yorkshire stone properly wrought and fixed, and with holes cut therein for the stench-traps and pipes; and to provide and fix six five-hole sink-stones properly dished each out of a piece of 4-in. Yorkshire stone 12 ins. square.

SLATER. (See §§ 542—3.)

Countess slating.

3784. To slate the whole of the sloping roofs of the five dwelling-houses, and of the offices thereof, with the very best strong countess slates, pointed on the inside thereof with stone-lime and hair mortar.

Nails, bond, &c.

(See § 1024.)

Filleting.

3785. To fillet the slating with pure Parker's cement, sufficient strong cast-iron nails being first driven into the brick-work, not more than 3 ins. apart, to secure the filletting.

eparation.

(See § 1025.)

CARPENTER AND JOINER. (See §§ 337—40.)

New materials, &c.

3786. To provide new materials for, and frame, fix, and finish all carpenter's work and joiner's work, which may be requisite for carrying into effect and for completing in every respect the intended dwelling-houses with the offices and appertenances thereof according to the drawings.

Ironmongery, &c.

3787. To provide for the carpenter's work and joiner's work, and use and fix thereto, all requisite spikes, nails, screws, and other proper ironmongery, and all requisite brass-work of the very best quality.

Timber and deal.

(See §§ 1031—2.)

Sundries.

3788. To provide and fix all requisite shores, struts, puncheons, oak-wedges, ties, cletes, beads, stops, fillets, tilting-fillets, backings, blocks, linings, casings, furrings, and rolls; to provide all requisite moulds, rods, and patterns for setting out and for executing accurately all the several intended works of the dwelling-houses and of the offices and appertenances thereof, and to perform such rebating, &c. (See § 1033.)

4 cwt. iron ties, &c.

3789. To provide and fix in and about the intended buildings 448 lbs. avoirdupoise of wrought-iron in such straps, ties, screw-bolts, or other light wrought and hammered work as the architect may direct; all additions to the said quantity and all deductions therefrom are to be taken after the rate of per pound avoirdupoise including the fixing thereof.

Centering.

3790. To provide, fix, ease when so directed, and finally remove, all centering and turning-pieces which may be requisite for the trimmers and arches of every kind.

Bond-timber and wood-bricks.

3791. To put all round in the new brick-work two tiers of fir bond-timber to each story above the basement, scantling 4 ins. by 2½ ins. properly lapped and spiked together in lengths as great as possible; and to put in the brick-work all wood-bricks requisite for fixing the finishings.

Lintels. (See § 1041.)

3792. To put the requisite lintels and filling-in lintels each of fir 5 ins. high as wide as required by the brick-work and 12 ins. longer than the clear width of the opening.

Basement flooring.

3793. To construct the basement-floors of all the five houses with oak sleepers 5 ins. by 3 ins., and fir-joists 4 ins. by 2½ ins., and to lay the same with 1¼-in. yellow deal clear of sap-wood.

Other floors of the house at the north-eastern part of the site.

3794. To repair and make complete all the present timber-floorings of the house at the north-eastern part of the site, using for that purpose the present timbers of the house, and providing and using in and about the work twenty cubic feet of fir timber of such scantlings as may be requisite; and in addition thereto to provide new wall-plates for the several floors, of fir 4 ins. by 4 ins., to be placed in the new brick-work; to lay the ground-story with 1¼-in. yellow deal half-boards listed free from sap-wood; and to re-lay the other floors of the same house with the best parts of the present flooring-boards made complete with at least 150 ft. superficial of new inch yellow deal.

Other floors.

3795. To construct to the ground stories, one-pair stories, and two-pair stories, of the four intended new houses, floors with fir wall-plates 4 ins. by 4 ins.; fir joists 7 ins. by 2 ins., and fir-trimmers and trimming-joists to the fire-places stair-cases and party-walls 7 ins. by 2¾-ins.; and to lay the whole of the said floorings with new 1¼-in. yellow deal half-boards listed free from sap-wood.

Roofs

3796. To construct the roofs over the whole of the five houses according to the drawings with wall-plates 4 ins. by 4 ins., rafters varying in scantling (according to the several bearings) from 3 ins. by 2 ins. to 5 ins. by 2 ins. and averaging 4 ins. by 2 ins.; ridges

and hips rounded for lead 6 ins. by 1 in., one valley-piece 5 ins. by 2 ins., one pair of gutter-plates each 8 ins. by 3 ins., one pair of gutter-plates each 7 ins. by 3 ins., framed bearers between the gutter-plates, 22 wrought angle-ties each 3 ft. long and scantling 3 ins. by 2½-ins., eight wrought dragon-pieces each 1 ft. 9 ins. long and scantling 3 ins. by 2 ins.

To provide and hang in the roof over the house No. 1, with strong hinges and fastenings, a 2 in. yellow deal sky-light glazed with 2nd Newcastle glass and with linings and all proper fittings complete.

3797. To construct in the roofs, dormers complete as shown by the drawings, with strong frame-work and ¾ in. deal cross-tongued and ledged doors hung each with a pair of 18 in. cross-garnet hinges a strong bolt and the requisite stops and other appertenances.

To provide four strong step-ladders in order to ascend to the roofs of the houses.

To put to the whole of the roofs and dormers, slate-battens ¾ in. by 2½-ins., and also all requisite springers and tilting-fillets.

The materials of the present roof of the house No. 1 at the north-eastern part of the site may be used again in the new roof of the same house, as far as the said materials remain sound and agreeing with the description herein contained.

ıtters, &c.

3798. To put inch yellow deal gutters with 2½-in. drips and currents full 1½-in. to every 10 ft. on strong heart of fir bearers; to put at the sides of the gutters the requisite lear-boards of ¾ in. deal 10 ins. wide; and to put at the ends of the gutters the requisite cess-pools, and the requisite troughs of 1¼-in. yellow deal very securely fixed.

ıartered par-ions. (See §§ 4—50, and 51—52.)

3799. To construct the quartered-partitions in the house No. 4, according to the drawings, with bottom-plate plates above the door-ways top-plates and door-posts each 4 ins. by 4 ins., two queen-posts to each story 4 ins. by 4 ins., struts 4 ins. by 3 ins., quarters 4 ins. by 2 ins., and two tiers of inter-ties to each story 2 ins. by 1¼-in.

in. framed deal ırtitions.

3800. To fit up and divide all the remainder of the houses and premises according to the drawings, with framed partitions with 2-in. deal bottom-rails, middle-rails, and frieze-rails, 8½ ins. wide, upper rails and styles and muntins of 2-in. deal 4 ins. wide, and panels of ¾-in. deal, neither glued nor more than 10 ins. wide.

The present partitions of the house No. 1 may be used again in the same house after being altered, repaired, and made complete.

ıternal room ors.

3801. To put to all the internal room door-ways, 2-in. deal four-panel doors, with panels of ¾-in. deal, and hung with 3½-in. wrought-iron butt-hinges, and with the best strong 7-in. iron-rimmed locks, with keys and plain brass furniture thereto, and with the requisite beaded stops and 1¼-in. single-rebated linings.

The present internal doors of the house No. 1 may be used again in the same house, after being thoroughly repaired and made complete.

Closet doors.

3802. To fit up all the closet door-ways with 1½-in. deal four-panel doors, hung with 3-in. wrought-iron butt-hinges and with the best strong 5-in. iron-rimmed locks, with keys and brass escutcheons, and with the requisite beaded stops.

External doors.

3803. To fit up the external front door-ways according to the drawings, with fir proper chamfered door-cases 5 ins. by 4 ins., tenoned at bottom into the stone steps and with a piece of 5 lb. milled-lead 12 ins. square wrapped round the bottom of each door-post and secured at the top by copper nails, and inch deal cross-tongued and strongly ledged doors beaded at the back and with chamfered fillets in front, hung each with a pair of 24-in. cross-garnet hinges, and with a best strong 9-in. draw-back iron rimmed lock with four keys, and each with two 10-in. barrel-bolts; and to provide and fix at each of the five external front entrances a strong and good gothic knocker, and a strong and good gothic scraper standing upon four feet.

Back doors.

3804. To put at the bottoms of the basement-stairs, 2-in. bead-butt and square framed four-panel doors, hung each with a pair of 3½-in. wrought-iron butt-hinges, a Norfolk thumb-latch, and two 9-in. rod-bolts, in a fir proper door-case 4 ins. by 4 ins. with lead at the feet of the door-posts as described to the other door-cases.

Coal cellar doors.

3805. To put to all the coal-cellars, inch deal cross-tongued, beaded, and strongly ledged doors, hung each with a pair of strong wrought-iron 20-in. cross-garnet hinges and a copper-warded 8-in. stock-lock, in fir proper door-cases 4 ins. by 4 ins. with lead at the feet of the posts thereof as described to the other door-cases.

Privy doors and fittings.

3806. To put to each of the privies an 1¼-in. bead-butt and square framed four-panel door, with portions of the upper panels left out for ventilation, and each hung with a pair of 3-in. wrought-iron butt-hinges, a Norfolk thumb-latch, and a small bolt.

To fit up the inside of each privy with inch clean deal seat riser and clamped flap and frame, with all requisite bearers and other appertenances, and the flap hung with 2-in. wrought-iron butt-hinges.

Mouldings round the doors.

3807. To put round the room-doors and closet-doors, mouldings 3 ins. girth as shall be directed.

Windows.

3808. To fit up the whole of the windows of the five houses with new 1½-in. yellow deal ovolo sashes, glazed with second Newcastle glass, and double-hung with iron axle-pulleys, large patent lines, iron weights, and strong brass spring-fastenings, in deal cased-frames with English oak sunk sills; and to put next the plastering round all the windows inch deal beaded quirked and grooved stops.

To put over the door of the house No. 1 a glazed sash similar to the other sashes.

Shutters.

3809. To put to the seven front windows on the ground-story 1¼-in. deal shutters, two panels high, with panels of ¾-in. deal,

hung with 8-in. butt-hinges, having rule-joints where requisite, and with two strong bolts to each window.

tings. 3810. To skirt the quartered-partitions with inch yellow deal, 8½ ins. high.

le staves. 3811. To put to all the projecting angles of the chimney-breasts, and other internal brick-work of the five houses, proper rebated and beaded angle-staves of inch deal.

ves. 3812. To put in each of the closets three shelves of inch-deal as large as the closet will admit of, and fixed with the requisite bearers.

-cases. 3813. To construct the stair-cases of the five houses, according to the drawings, with 1¼ in. yellow deal risers, steps, and landings, housed into 2-in. deal string-boards and wall-strings, turned and framed newels 3¾ ins. by 3¾ ins., strong deal moulded hand-rails with mitred caps, bar balusters 1⅛ in. square, solid blocked bottom steps, inch deal beaded apron-linings, and all proper blockings and other fittings and appertenances complete.

-bins (or of t-work in er's cement.) 3814. To provide and fix in such situations as shall be directed five dust-bins, with fronts and inclosures of 1¼ in. yellow deal, and all proper fittings and appertenances complete.

ing-work. (See § 1070.)

ubic feet of ctra. (See § 1071.)

PLASTERER.

. S. and W. 3815. To lath, plaster, set, and whiten ceilings, and strings to every part of the whole of the five houses.

. and colour. 3816. To render and set the whole of the internal brick-work of the five houses (that of the cellars only excepted) finishing the same with sharp sand to resemble trowelled stucco, and colouring the whole stone-colour when dry.

To form proper quirks to the angle-beads and wherever else requisite.

er's cement ing. To run all round the walls to every story of the five houses, skirtings of new quick Parker's cement 8½ ins. high projecting ½ in. and teinted stone-colour.

PLUMBER.

. milled-lead rs. 3817. To lay all the gutters and the valleys with milled-lead, weight 6½ lbs. to the foot superficial, turned up 5 ins. high against the brick-work, and turned up full 9 ins. in every other case; and to line the troughs or heads to the rain-water-pipes with similar lead.

4-lb. milled-lead flashings.

3818. To put in the brick-work all round the gutters, flashings of 4 lb. milled-lead, 5 ins. wide.

4-lb. milled-lead to hips and ridges.

3819. To cover the hips and ridges of the principal roofs, and of the roofs over the dormers, with 4 lb. milled-lead 16 ins. wide, properly secured with lead-headed nails.

4-lb. flashings, &c. to dormers and sky-light.

3820. To put all round the dormers, and round the well of the sky-light, flashings and aprons of 5 lb. milled-lead 12 ins. wide, properly secured with copper nails.

Eaves'-guttering.

3821. To provide and fix on strong brackets round two of the yards, in the situations shown by the plan of the roofs, strong cast-iron 5-in. eaves'-guttering, with proper corner-pieces thereto.

Cast-iron R. W. pipes.

3822. To provide and fix five stacks of cast-iron rain-water pipe 3 ins. bore, and one stack of cast-iron rain-water pipe 4 ins. bore, all fixed with the requisite heads, and carried down below the seats of the privies.

Water-butts.

3823. To provide and fix above the privies five strong new water-butts, each 5 ft. high, pitched thoroughly on the insides.

Laying on water, &c.

3824. To lay on the water to each of the five water-butts with $\frac{3}{4}$ in. strong lead pipe, ball-cock and the other requisite appertenances.

To put from near the top of each water-butt down to below the seat of the privy underneath the same, an inch strong lead over-flow pipe; to put from each water-butt to the adjoining sink, and to each sink-stone a $\frac{3}{4}$ in. strong lead pipe and a brass cock; and to put from each sink to below the adjoining privy-seat a strong lead 2 in. waste-pipe, with a large bell trapped grating at the top thereof.

PAINTER.

3825. To clean from rust and paint four times with the best oil-colour all the rain-water-pipes, area-gratings, and other iron-work of the five houses and of their offices fittings and appertenances, the first two coats of painting being done with red-lead colour.

3826. To knot, stop, pumice smooth in every part thereof, prepare properly, and paint four times with the best oil-colour, the whole of the internal and external wood-works and other works usually painted of the whole of the houses and of their offices fittings and appertenances.

CHAPTER XXXVIII.

SPECIFICATION OF THE WORKS *to be done in erecting and completely finishing an* EXTENSIVE STACK OF WAREHOUSES *for* *on*

(Insert list of Working-drawings. See § 986.)

BRICKLAYER.

Notices, &c. to the District-surveyor and other officers.

3827. To give to the District-surveyor, to the surveyors of the sewers and pavements, and to all other public officers, from time to time, all the requisite notices, and to pay to them all their proper official charges and fees for the buildings and works intended to be executed.

Ground-work and cartage.

3828. To perform all digging and ground-work (not previously done) which may be requisite in or about every part of the foundation-works and drains of the intended buildings, and in the preparation for and the performance of all other works which are intended to be done upon the premises.

3829. To remove all the ground and rubbish now lying upon the site of the intended buildings, and to dispose of the same between the walls and over the courts, yards, areas, roads, avenues, and other parts of the entire site of the intended establishment, and in leveling and bringing up the site or platform of the whole premises to the heights shown by the sections and other drawings ; to provide bring in and spread over the premises dry hard ground and brick-rubbish sufficient for making up all deficiency in the quantity of ground and rubbish now lying on the site of the intended establishment, and which extra ground and rubbish may be requisite in order to lay the pavings and floors at the several heights shown by the sections and other drawings.

3830. To ram continually, beat down, and consolidate in every part in the most perfect manner, all the ground soil and rubbish laid and to be laid upon the entire premises, and more particularly around all the brick-work intended to be done, and under all the intended pavings.

3831. To pump away, bale out, and remove effectually from time to time as by occasion may be required, and as the architect may direct, all water which may come into or upon any part of the premises of the intended establishment during the executing of all the works hereby intended to be done, whether arising from rain, springs, currents, drains, tide, or from any other cause whatsoever.

3832. To dig out, cart away, and remove altogether from the entire premises from time to time as occasion may require, and as the architect may direct, all soft soil, mud, slime, filth, and other matters calculated to cause a nuisance upon the premises,

or to injure or impede the works; and to remove from the entire premises all rubbish, earth, and useless materials at the final rendering up of the whole of the buildings, works, and premises as complete.

General brick-work.

3833. To execute in the very best manner, all brick-work requisite for carrying into effect the whole design of the buildings including all the foundations, piers, walls, and other appertenances thereof.

Rough arches.

3834. To turn rough internal arches and counter-arches wherever requisite to the whole of the buildings of every kind, the centres being in every instance kept up till directed by the architect to be in the first instance eased, and after that finally and wholly removed.

Vaultings. (See § 2528.)

3835. To vault the intended cellars according to the drawings with groined-work, having the groin-points thereof properly cut, and the spandrils filled up to within 6 ins. of the summit of the back of the vaulting.

Parapets, cornices, fascias, &c.

3836. To execute the parapets of the whole of the main buildings as shown by the several elevations, with fascias, projections, and brick cornices; the brick cornice round all the walls on the four sides of the principal court are to have the addition of modilions or brackets of shaped and rubbed bricks set on end alternately with bricks rubbed and set on end flat-wise according to the drawing No. . To finish the four gate-piers with bracket-cornices of brick-work all round each pier, as shown by the drawing.

Second malm facings.

3837. To face the whole of the principal or West façade of the intended buildings, including the shafts of the pilasters, the fascias, and all the returns thereof, and every part of the brick-work of the entrance from in the neatest and most workmanlike manner with the very best hard-burnt second malm stock-bricks matched of uniform colour, laid in manner of Flemish-bond with all the heading-bricks thereof carried into the work wherever possible, and with the external joints struck and drawn fairly. (See § 358—60.)

Other facings.

3838. To face externally all the other brick-work throughout every part of the intended buildings, with picked stocks matched of a bright uniform colour, and laid in manner of English bond.

Gauged arches.

3839. To put to the principal gateways next the court and to all the external doors and windows (except where otherwise shown or directed) gauged-arches according to the drawings, cut in a close and accurate manner, and properly set: the arches of the principal front are to be 8 ins. wide on their soffits; the other arches are to have in general soffits 4 ins. wide except where by the drawings shown differently. The arches of the two principal gateways next the court are to be chamfered on their edges, but with the appearance of key-stones left unchamfered as shown by the drawings.

CHAPTER XXXVIII.

Chimneys.

3840. To erect all the chimneys and chimney-shafts according to the drawings; the chimney-breasts are to be carried up no higher above the mantles than may be requisite to gather over the work properly.

3841. To properly turn, parget, and core all the flues; to put to each of the fire-places on the ground-story a 4-in. brick fender for the support of the stone slab, with two courses of footings in 9-in. brick-work; to put to each of the other fire-places above the ground-story a 4-in. brick trimmer at least 18 ins. wider than the chimney-opening.

Cuttings, &c.

3842. To cut and rub proper rebates for the gates and the iron doors through the party-walls of the warehouses.

To execute all requisite splays, birds'-mouths, skew-backs, chamfers, and other cuttings of every kind.

Bedding, pointing, &c.

3843. To bed in mortar all the bond-timber, lintels, plates, templets, wood-bricks, sleepers, the curbs of the dung-pits, and the other works of every kind which may so require. To bed and point round with lime and hair mortar, all the window-frames, fixed sashes, door-frames, all the posts and lintels of the gates, and all the other work of every kind so requiring. To back up and fill in with brick-work to all the timber-work and stone-work of every kind.

Piers under the ground-floors.

3844. To erect for the support of the sleepers of all the wood floors of the ground-story throughout the several buildings, brick piers not in any instance more than 3 ft. apart; each pier is to consist of two courses of brick-work 9 ins. square, and two courses of brick-work 9 ins. by 4½ ins.

Brick paving.

3845. To prepare properly the ground, and to pave every part of the arched cellars with hard stock-bricks laid on edge in mortar and grouted with liquid mortar between the joints thereof.

Tile-crestings and brick-on-edge in Parker's cement.

3846. To finish all the party-walls, and behind the stone-work of the attic of the centre-piece of the principal façade of the buildings, with double plain-tile crestings and brick-on-edge both set and jointed with Parker's cement and clean Thames sand mixed together in equal measures.

To finish all the dwarf walls and the other external walls which are not intended to have stone-copings, with brick-on-edge set in Parker's cement and clean Thames sand mixed together in equal measures.

Drains.

3847. To construct proper barrel drains for the whole of the premises and buildings of the intended establishment as shown by the Plan No. 1. The principal drains are to be 20 ins. diameter withinside, the minor drains are to be 12 ins. diameter withinside; the whole of the drains are to be composed of 4-in. brick-work, the lower half of each drain is to be stuccoed over ¾ in. thick with pure Parker's cement.

3848. To put at the foot of each of the rain-water pipes soil-

pipes and waste-pipes, a proper brick funnel set in Parker's cement to lead down into the drain. (See § 1104.)

3849. To put from each of the twelve five-hole sink-stones described in the Mason's work, a funnel to lead into the principal drain not less than 9 ins. internal diameter, of brick-work set in Parker's cement and clean Thames sand mixed together in equal measures.

Cess-pools, &c. to gully-holes.

3850. To put to each of the twenty-four gully-hole-gratings described in the Smith's work, a cess-pool 15 ins. square inside, with sides of 9 in. brick-work not less than 5 ft. deep, and paved with bricks laid flat; and to bed over the same, the iron grating so as to suit properly the kennel of the paving.

Stench-traps.

3851. To form to the drains, twenty stench-traps set in Parker's cement and Thames sand mixed together in equal measures, each trap is to be worth at least twenty shillings.

— rods extra brick-work.

(See § 1007.)

Bricks.

3852. All the bricks to be used in the brick-work (except those of the malm-facings and gauged arches) are to be the very best new approved hard-burnt square grey stock-bricks, without any admixture of soft bricks, place-bricks, slackly-burnt bricks, or other inferior bricks.

Mortar.

3853. The whole of the mortar is to be compounded in the proportion of one third part by admeasurement of the very best fresh-burnt Dorking stone lime, or Lee's Medway grey stone lime, and two third parts by admeasurement of the best clean sharp Thames sand; all the mortar is to be ground in a proper mill.

Grouting, &c.

3854. The whole of the brick-work is to be flushed quite full with mortar at every course thereof, and is to be effectually grouted with liquid mortar at every alternate course thereof, great care being taken that the facings thereof shall not be stained.

Mode of doing the work.

(See §§ 1010. 353—365.)

Lime-whiting to the warehouses, cart-houses, stables, &c.

3855. To strike very neatly all the internal joints of the whole of the interior brick-work, and to lime-whiten twice with Dorking stone lime the same, and all the timbers and the under-sides of the floors and the under-sides of the unplastered roofs of all the warehouse-buildings cart-houses and stables throughout the whole of the intended establishment.

Reparation of settlements, &c.

(See § 1111.)

Scaffolding, tackle, &c.

(See §§ 1255, 2259, 3038, 3080—4.)

Jobbing-work.

(See § 1011.)

CHAPTER XXXVIII.

MASON. (See §§ 265—295.)

3-in. Yorkshire stone to foundations.

3856. To provide and bed beneath the footings of all the walls as shown by the plan No. 1, two complete layers of Yorkshire stone not in any part thereof less than 3 ins. thick, and of the several widths figured on the plan and the various sections; the stones thereof are to be laid as close together as possible, and no stone thereof is to contain less than 10 ft. superficial.

4-in. Yorkshire stone under the story-posts and columns.

3857. To put under each of the 66 piers for the support of the wood story-posts of the warehouses, also under each of the piers for the support of the columns a piece of 4-in. Yorkshire stone four feet square.

Granite corbeilles.

3858. To put in the party-walls 32 double corbeilles to support the ends of the girders composed each of a piece of granite square curb 3 ft. long and 12 ins. by 8 ins. set on edge and with the outer lower corners rounded off. To put in the party-walls 16 double corbeilles of granite similar to those last described for the support of the ends of the tie-beams of the roofs.

To put in the walls next the two principal gateways 24 corbeilles in all respects the same as those last described, except that they are each to support only one girder, and are to be only 1 ft. 10 ins. long.

To put in the walls last described 12 granite corbeilles each 1 ft. 10 ins. long for the support of the tie-beams of the roofs finished as the other corbeilles.

32 granite templets 4 ft. long.

36 ditto 3 ft. long.

3859. To put in the brick-work immediately under each of the 32 larger corbeilles last described, in order to prevent the walls from splitting by the burden of the floors, a templet of granite square curb 12 ins. by 8 ins. and 4 ft. long; and to put under the 36 smaller corbeilles 36 templets, each 3 ft. long, of granite curb the same as the granite templets last described.

Plinth.

3860. To provide and fix a plinth without horizontal joints composed of the best Bramley-fall stone 3 ft. 6 ins. high as shown by the drawings all along the whole Western or principal front of the buildings next the plinth is to be 1 ft. 9 ins. thick along the projecting centre part beneath the large pilasters and 12 ins. thick at the wings of the front, and is to have in addition all the mitres and returns thereof as shown by the drawings worked out of the solid stone; the top of the plinth is to be sunk and weathered; all the joints of the stone are to be worked quite fairly; each of the said joints is to have therein two gun-metal cramps shaped and formed thus ⊢⊣, weight 16 oz. avoirdupoise, thoroughly run with lead, to hold the two stones meeting together at the joint, and to clinch behind in the brick-work: all the parts of the plinth where in sight are to be finished very neatly in manner of very broad channeled tooled-work.

Window-cases, &c.

3861. To provide and fix the twenty window-cases and the front door-case, all at the lower story of the principal or Western front of the buildings, entirely of solid Bramley-fall stone, of the several dimensions, scantlings, and forms shown by the elevations

and detail drawings, the jambs thereof set with Yorkshire stone plugs 4 ins. long and 2½ ins. square inserted in the sills and heads (*or with plugs of gun-metal, as the case may be*).

3862. The whole of the stone window-cases and the front door-case are to be finished where in sight with channelled tooled-work to correspond with the plinth beneath them.

3863. Each jamb lintel and sill of the window-cases and door-case is to consist of no more than one piece of stone.

Plinth to the two principal archways.

3864. To put for the support of the piers of the two principal archways in the Western front of the buildings four solid square blocks of Aberdeen granite, each thereof to finish 3 ft. 6 in. high, 3 ft. 5 ins. wide on the face, and 2 ft. 7 ins. deep; the external parts within view of each of the granite blocks are to be tooled quite fairly all over, and each block is to have two Yorkshire stone plugs 4 ins. long let thereinto, and also into the pier-stone above the same (*or plugs of gun-metal, weight* 4 *oz., as the case may be*).

Two principal archways, &c.

3865. To execute the two principal archways, and the piers supporting the same, of the Western front of the buildings with the best Bramley-fall stone, as shown by the several drawings; the jambs are to be worked out of stone in courses alternately square on the bed 2 ft. 4 ins. by 2 ft. 7 in., and alternately of the same length and breadth, but sawn away feather-edged at the back, so as to save stone, and to bond the better with the brickwork; the voussoirs of the two arches are to be entirely worked out of solid square stone; each horizontal joint in the piers is to have two Yorkshire stone plugs therein, 2½ ins. square and 4 ins. long (*or gun-metal plugs, as the case may be, each weight* 4 *oz.*), every joint in the piers and arches is to have a plate of 5 lb. milled-lead extending the whole size of the stone except to within 2 ins. of the outside thereof.

3866. The arches and piers are to be rusticated, and are to be finished in the very best manner as shown by the drawings, with rock-work or bark-work according to a plaster model to be furnished by the contractor at his own expense, to the approbation of the architect, but in furnishing which model the contractor is not expected to expend more than the sum of 1*l.*

Pilaster bases and capitals.

3867. To provide and fix ten bases, and ten capitals for the brick-pilasters of the Western or principal front of the buildings, wrought as shown by the drawings out of the best solid Bramley-fall stone, finished with very neat small channelled tooled-work over their whole external faces. The bases are to be each cut out of stone to finish 5 ft. 2 in. long, 1 ft. 6 ins. high, and 1 ft. 9½ ins. broad on the bed; the capitals are to be cut out of solid stone to finish 4 ft. 3 ins. long, 2 ft. 4 ins. high, and 1 ft. 4 in. broad on the bed.

Architrave moulding.

3868. To provide and fix at the top of the brick fascias of the architraves, above the pilasters of the advanced centre of the principal façade of the building, a cavetto moulding and fillet, finished with channelled tooled-work to the profile shown by the drawings No. , cut out of solid Bramley-fall stone to hold

scantling 8½ ins. by 6½ ins., plugged and channelled with lead, and with proper sunk top and water-joints thereto : none of the stones of this moulding are to be in length less than 3 ft., and the two angular stones are to have sufficient additional width on their beds, so as to return back at the sides without joints other than at the returning inner angles of the work.

Ogee moulding ranging with the cavetto, &c. last described.

3869. To provide and fix all along the two wings of the principal façade of the buildings, so as to range with the cavetto-moulding last described, and to extend from the architrave over the centre-pilaster quite round the angles of the Northern and Southern fronts of the principal buildings, and as far as shown by the elevations, the ogee moulding, according to the profile given by the drawing No. , cut out and finished on the face with channelled tooled-work, from Bramley-fall stone, scantling 10 ins. by 8 ins., no piece thereof being in length less than 3 ft.

Fillet over the last described moulding.

3870. To put over the moulding last described, a sunk weathered and throated fillet, cut out of solid Bramley-fall stone, scantling 1 ft. 3½ ins. by 10 ins. ; the joins therein are to be plugged and channelled with lead, the sunk top is to have proper water-joints, and all the faces of the work within view are to be finished with neat channelled tooled-work.

Band to two projecting chimney-stacks.

3871. To put round the two projecting chimney-stacks of the Northern front of the buildings, a stone fillet or a band to correspond with that last described, but having only 6 ins. bed.

Cornice over the two front principal gateways.

3872. To provide and fix upon the ogee bed-moulding over the two front principal gateways in the wings of the Western façade of the buildings, a plat-band with mutules or blocks beneath the same, worked out of solid Bramley-fall stone scantling 1 ft. 7 ins. by 9 ins. ; and to put over the blocks a corona and a crown-moulding, worked out of the same kind of stone as the blocks, scantling 2 ft. 4 ins. by 11 ins. : this entire cornice is to be finished with neat channelled tooled-work ; the upper bed of the stone-work is to be jointed and channelled with lead, and the top thereof is to be sunk out of the solid stone with proper current, so as to cast the wet back into the lead gutters of the roofs behind the same.

Cornice over the centre-piece of the principal façade.

3873. To provide and fix for the formation of the great cornice above the ten pilasters of the Western or principal façade of the buildings, the following stone-work :—

3874. An ogee bed-moulding in all respects the same as that described for the cornices over the wings of the façade, but wrought out of Bramley-fall solid stone scantling 12 ins. by 8 ins.

3875. A soffit to the cornice composed of the best hard compact weather-proof 3½-in. Yorkshire stone ; every stone of the said soffit is to be 3 ft. 8 ins. by 4 ft. 6 ins., and is to have wrought thereon half an inch current each way into the cast-iron modilion gutters as described in the Smith's work.

3876. A crown-moulding with proper sunk water-joints chan-

nelled and run with lead, and composed of Bramley-fall stone scantling 12 ins. by 11 ins. wrought out to the profile shown by the drawings, and finished with neat channelled tooling.

Blocking.

3877. To finish the wings and the other parts of the buildings as shown by the drawings, with blockings of Bramley-fall stone of the several heights and scantlings according to the elevations and sections, and with as few joins as possible; each joint therein is to have at the back thereof two very strong 10-in. copper cramps let into the stone-work, and completely run over with lead: all the blockings are to be finished on the fronts and edges thereof with smooth rubbed work.

Impost mouldings to the attic.

3878. To provide and fix upon the attic pilasters surmounting the pilastrade of the principal façade of the buildings, impost capitals of Bramley-fall stone, worked according to the drawings, each out of one piece; the two angular impost capitals are to be each 3 ft. 10½ ins. long, 3 ft. 1½ ins. wide, and 12 ins. high; the eight other impost capitals are to be each 3 ft. 10½ ins. long, 2 ft. 10 ins. wide, and 12 ins. high; the tops of all the impost capitals are to be sunk out, so as to cast the wet into the gutters behind the same.

3879. To put on the plain walling between the ten attic-pilasters, an impost moulding, as shown by the drawings, cut out of Bramley-fall stone 12 ins. wide, 5 ins. high in front, and 3 ins. high at the back thereof.

Sills.

3880. To put to all the windows of the one-pair and two-pair stories of the Western or principal front of the buildings, weathered and throated sills of Bramley-fall stone 12 ins. wide, 4½ ins. thick in front, and 2 ins. thick at the back thereof, and to put to all the other windows and blank window-recesses corresponding therewith, throughout all the buildings of the intended establishment, sills in all respects as those last described but only 8 ins. wide.

Each of the sills is to be 3 ins. longer than the opening in which it is placed.

Granite string-courses.

3881. To put over the windows of the ground-story and one-pair story all along such parts of the external elevations as the various drawings so exhibit, string-courses composed of granite curb scantling 12 ins. by 8 ins. with the joints and external faces and soffits thereof tooled fairly.

Note.—The elevations show the manner in which the wood lintels over the gates to the lower warehouses unite with and appear to form parts of the string-courses.

3882. The string-courses along the projecting masses of building containing the principal gateways are to project 1½ in. and are to be weathered ½-in. on the top thereof, and throated on the under-side thereof: the other string-courses are to be set flush with the outer face of the brick-work.

Stone-work to the iron doors.

3883. To put to each of the iron doors of communication through the party-walls, a rebated lintel 6 ft. 6 ins. long of parrallel granite square curb 12 ins. by 8 ins. set edgewise and dressed fairly, a sill of 3-in. tooled Yorkshire stone 13 ins. wide and 5 ft.

9 ins. long, tooled fairly on the edges thereof, and four bond-stones in the jambs each 18 ins. long, 9 ins. high, and 13 ins. wide, of Yorkshire stone tooled all over where in view.

(See §§ 53—4 of the Building-act.)

3884. (*If the District-surveyor construe the Building-act literally, he will require entire door-cases of stone, though as bricks in general resist destruction by fire better than stone, the description above given would provide for a more exact fulfilling of the spirit of the Act, which is for the prevention of fire. This method has been allowed by a District-surveyor.*)

Copings of the northern and southern fronts, &c.

3885. To provide and fix all along the parapets of the Northern and Southern fronts of the Buildings, and to all the chimney-shafts, breaks, and returns of the advanced masses of building in the same fronts, and also along the parapet of the office-building adjoining the warehouse copings of Bramley-fall stone, throated, and run with lead at all the joints thereof; the copings of the parapets and of the walls between the chimney-shafts are to be 13 ins. wide, 4 ins. thick in front, and 2 ins. thick at the back thereof; and holes are to be cut through the copings for the chimney-flues; the parts of the copings running across the bottoms of the chimney-shafts are to be 6 ins. wide, 4½ ins. high, and sunk on the top so as to show 4 ins. wide on the face; and the coping of each chimney-shaft is to be in a single stone 5 ins. thick, and projecting 2 ins. every way beyond the brick-work.

Copings to the parapets with modillions of brick. See Drawing No.

3886. To cover the brick modilion-cornices of the parapets all round the principal court, with coping of Bramley-fall stone 1 ft. 8 ins. wide, 4 ins. thick in front, 2 ins. thick at the back thereof, chamfered in front, and throated at both back and front; the whole of this coping is to be rubbed, is to be run with lead, and is to have two lead plugs at every joint therein.

Other copings.

3887. To put to all the remainder of the parapets of the principal buildings, copings of Bramley-fall stone 1 ft. 2 ins. wide, 4 ins. thick in front, 2 ins. thick at the back thereof, throated at both back and front, channeled and run with lead, and with two lead plugs at every joint therein.

All the copings are to have the requisite solid quoin-stones, with proper mitred sunk-work thereto.

Granite sills to the warehouses, cart-houses, &c.

3888. To put along the fronts of all the cart-houses and under all the gates of the lower warehouses, continuous sills of granite square parallel curb 12 ins. by 8 ins. in as long pieces as possible (none less than 4 ft.) with two gun-metal plugs each weight 6 oz. in each joint run with lead.

To cut out in the granite sills, mortise-holes in order to receive the plugs intended to be cast at the bottoms of the iron socket-bases.

Granite sills to the stables.

3889. To put to each of the stable-doorways, a sill composed of granite curb not less than 9 ins. by 6 ins. set edge-wise, and with proper mortise-holes cut therein for receiving the ends of the door-pots.

2½-in. Yorkshire stone paving and granite curb.

3890. To make up, consolidate, and prepare to proper levels

the ground, and to pave all over the lower story of each of the warehouses (a piece of paving to each warehouse 12 ft. by 20 ft. described hereafter to be of granite, only excepted) with the best tooled Yorkshire stone not less than 2½ ins. thick in the thinnest parts thereof, and laid in the closest possible manner in regular courses with all the joints thereof tooled square quite through the whole thickness of every stone thereof.

3891. To put all round the buildings adjoining to the principal court, all along on both sides of the two principal front-entrance gate-ways, and also against all the other walls and in the other situations where shown by the ground-plan, foot-way pavings in general ft. wide including the granite curb, but of greater width where so shown by the drawings: the foot-way pavings are to consist of tooled Yorkshire stone not less than 2½ ins. thick in any part, and granite parallel square curb 12 ins. by 8 ins. with circular corners according to the plan: all the joints of the curbs and pavings are to be tooled fairly all the way through the thickness of the stone, and are to be set in the closest possible manner.

Spur-stones.

3892. To provide and fix in the curbs of all the foot-way pavings throughout all the intended establishment, two granite spur-stones opposite to each of the gate-ways of every kind throughout all the buildings against which the foot-ways are to be placed: each of the spur-stones is to be wrought out of a piece of granite 12 ins. square and 3 ft. 3 ins. long, circular upwards from the curb in which it is to be set.

Pebble paving to the stables, cart-houses, stable-yards, and office-courts.

3893. To make up with sufficient dry rubbish, and to ram down the ground and rubbish hard and to proper currents all over the whole area of the stables, of the cart-houses, and of all the stable-yards and office-courts of every kind; and to pave over every part of the ground of all the said buildings areas courts and spaces, with paving of the best 6-in. pebbles, sorted of uniform sizes, and laid upon full 3 ins. in depth of the best rough ballast, fitted together dry and close stone to stone, without intervals, except where from the corners of the same being rounded off they will not unite closely, and covered over on the top with sufficient screened gravel to work into the small spaces which will be left in the pavement after the same is set as closely as possible. All the pavings are to be laid to such currents as the architect may direct.

6-in. granite paving.

3894. To make up, consolidate, and prepare the ground with sufficient hard rubbish; and to pave with the very best Aberdeen granite carriage-way paving 6 ins. in depth the whole area between the footways of the principal court, those of the two principal western gateways, and a portion of 12 ft. wide and 20 ft. long adjoining to the gateway within each of the lower warehouses, upon which carts may back.

3895. The whole of the granite carriageway-paving is to be laid to such currents as shall be by the architect directed, upon full 3 ins. in depth of the best rough ballast, and is to consist of stones well dressed, no stone thereof containing on the under side thereof

less superficial extent than two thirds of the superficial extent of the upper side of such stone; all the paving is to be laid dry and close stone to stone, and when viewed and approved of by the architect and not before, is to be covered over with sufficient screened gravel to be left to work into the joints of the same.

2½-in. Yorkshire stone hearths and slabs to the counting-house chimneys.

3896. To put to each of the fire-places of the counting-houses a hearth and a slab of 2½-in. Yorkshire stone paving 18 ins. wide and 16 ins. longer than the chimney-opening.

Chimney-pots.

3897. To provide and fix in Parker's cement twenty-eight ornamental chimney-pots according to the drawings No. formed of terra-cotta.

Extra stone-work.

3898. To provide and fix under the contract fifty cubic feet of Bramley-fall stone, including plain-work and setting thereto; and to provide and lay under the contract also five hundred feet superficial of new 2½-in. Yorkshire stone paving laid in regular courses; which extra stone-work is to be used in such additional works as the architect may direct, and in case the whole or any portion thereof should not be directed by the said architect to be so used, the value thereof shall be deducted from the amount of the consideration of the contract after the rate of
for every cubic foot of Bramley-fall stone, and after the rate of for every superficial foot of Yorkshire stone paving, including the workmanship and fixing thereof.

Quality of the stone.

3899. The whole of the stone to be employed in the execution of the contract is to be selected of the very best quality free from shakes, flaws, vents, veins, stains, metallic-ore, and every other defect.

Sundries, labour, &c.

3900. To provide all requisite lead for the water-joints, joggles, and other joints of the mason's works of the intended new building.

To work all proper and requisite fair-edges, rebates, back-joints, joggles, mortise-holes, chamferings, throatings, and weatherings; and to perform to the mason's work all the other labour and workmanship proper and necessary to mason's work.

Damage, cleaning, &c.

3901. To take out all defective stones, and repair as shall be directed by the architect all damage which may occur to the mason's work of every kind during the progress of the works and buildings and during after the rendering up of the same as complete.

3902. To clean off in a proper manner all the stone-work of every kind when so directed by the architect shortly prior to the final rendering up of the whole of the works as complete.

SLATER. (See §§ 542—3.)

Countess slating.

3903. To slate the whole of the roofs over the warehouses stables counting-houses privies and all the other intended build-

ings of the establishment (including the tops and the sides of all the dormers thereof) with the very best strong countess slates securely nailed with strong copper nails, with proper bond in every part thereof, and with cut heading-courses with bond thereto the same as to the remainder of the work.

Pointing.

3904. To point all the slating on the inside thereof with stone-lime with sufficient hair therein.

Reparation.

3905. To repair all damage which may occur to the slating during the progress of the other works of the buildings from accident or other cause, and finally to leave the whole of the slating perfect at the rendering up of the whole of the buildings and premises as complete.

CARPENTER AND JOINER. (See §§ 337—40.)

Materials, &c.

3906. To provide materials for, and frame, joint, fix, and execute all carpenter's work and joiner's works of every kind with ironmongery and all other fittings and appertenances of the best quality complete which may be requisite in order to carry into effect and to finish in every part and in every respect according to the design, and to render the intended warehouses and other buildings and works in every respect finished and fit for immediate use or occupation.

Timber and deals.

3907. All the oak timber for the sills, sleepers, and other works is to be of the best description of English growth ; all the other timber requisite for the thorough completion of the buildings and works is to be either Dantzic Riga or Memel fir, of the very best quality. All the floors and joiner's works are to be of the best yellow Christiana deal, except where herein otherwise directed.

3908. All the timbers are to be cut out perfectly square and free from the least sap-wood in any part thereof, and also from shakes and large knots, wany edges, and all other defects whatsoever. None of the joists, rafters, ceiling-joists, cradlings, or quarterings intended to be plastered are to be respectively more than 12 ins. apart in any one instance.

Centering.

3909. To provide, fix, case, and finally remove when so directed by the architect for the time being of centering and turning pieces for all the vaultings, rough and ganged arches, and trimmers, and for the stone-work of the two principal gateways.

Casing to stone-work, &c.

3910. To case up all the stone-work, and the angles of the brick pilasters fascias and quoins, and of the wood posts, and all the other works of every kind which might otherwise receive injury from the carrying on of the works of the buildings.

Bond timber.

3911. To put all round in the brick-work of the several intended buildings the following fir bond-timber :—

Two tiers round each story of all the warehouse-buildings.

(*Note.* That each of the party-walls is not required to have more than two tiers of bond-timber therein to each story, although serving two adjoining warehouses.)

One tier in each story of the cart-houses, stables, lofts, counting-houses, and other office-buildings of the warehouses.

All the bond-timber is to be when cut out of scantling full 4 ins. by 2½ ins. and is to be in the greatest possible lengths, without scarfings, except at the angles of the buildings.

Wood-bricks.

3912. To put in the brick-work such wood-bricks only as are absolutely requisite for receiving the ends of the lintels and for fixing the joiner's works.

Lintels. (See § 1041.)

3913. To put fir lintels and filling-in-lintels where requisite for the several openings throughout the whole of the intended buildings, each lintel is to be of the dimensions shown in the drawings, and where not shown thereby the scantling is to be 5½ ins. by the width of the brick-work, and the length 18 ins. greater than the clear width of the openings.

Sundries.

3914. To fix all the smith's work so far as connected with the carpenter's work.

3915. To provide and fix all requisite templets, blocks, stops, linings, casings, fillets, tilting-fillets, rolls for lead, furrings, cradlings, backings, grounds, beads, cappings, keys, clamps, ledges, and other usual and appropriate fittings and finishings for the carpenter's work and joiner's work.

3916. To perform all needful framing, housing, rebating, tonguing, mitring, dove-tailing, planing, beading, grooving, chamfering, scribing, and all other work and labour proper to the wood-work.

3917. To provide from time to time as occasion may require, all rods, moulds, gauges, rules, laths, and trammels, which may be necessary for setting out and for adjusting the brick pilasters and the several other works of every kind of the whole of the buildings.

Warehouse floors throughout the buildings.

	Ins.	Ins.
3918. Fir story-posts	8	by 8
Oak caps to ditto 3 ft. long with splayed ends so as to be cut one out of another to an average length of 2 ft. 9 ins.	8	— 6
Each of the story-posts over the vaulting is to have a templet-base of oak similar to the caps last described.		
Girders	12	— 8
Wall-plates set edgewise	6	— 4
Joists	9	— 2½
Trimming-joists	9	— 3
Rough floors of 1¼-in. yellow deal listed free from sap-wood, rebated and filleted with wrought-iron fillets		

		Ins.	Ins.
	$1\frac{1}{8}$-in. by $\frac{1}{16}$ in. on the underside at all the joints thereof.		
	The girders over the two principal gateways are to be sawn down the middle thereof and are to have cradling as shown by the section No. .		
Floors of the hay-lofts.	3919. Plates	4	— 4
	Joists	8	— $2\frac{1}{2}$
	Trimming-joists	8	— 3
	1 in. yellow deal boarded-floors listed free from sap-wood.		
Floors of the hay-lofts of the office-buildings adjoining to the warehouse No. .	3920. Wall-plates	4	— 4
	Four binders over the heel-posts of the stables ...	12	— 4
	Four ditto framed into the breast-summers of the cart-sheds	12	— 6
	Joists	5	— 2
	Trimming-joists	5	— $2\frac{1}{2}$
	Inch yellow deal boarded-floors listed clear of sap-wood.		
Ground-floors to the counting-houses wherever not directed to be framed.	3921. Fir joists	$4\frac{1}{2}$	— 2
	English oak sleepers	$4\frac{1}{2}$	— 3
	$1\frac{1}{4}$-in. yellow deal floors of boards sawn down the middle thereof and listed free from sap-wood and laid with straight-joints.		
Principal roofs over the warehouses with four trusses and four return trusses to each	3922. Wall-plates set on edge	6	— 4
	Oak corbeilles	8	— 6
	Tie-beams	10	— 6
	Diagonal-ties each 5 ft. long to receive the hip-rafters	10	— $2\frac{1}{2}$
	Dragon-pieces to ditto each 3 ft. long	10	— 2
	Queen-posts in the waists 6 ins. by 4 ins. and at the head and feet	6	— 7
	Principal rafters at bottom 6 ins. by 7 ins. ditto at top	6	— 6
	Struts	4	— 3
	Collar-beams	6	— $7\frac{1}{2}$
	Pole-plates where over the wall	5	— 4
	Purlins	$9\frac{1}{2}$	— $5\frac{1}{3}$
	Blocks under the purlins each 18 ins. long	7	— 4
	Common rafters...	$3\frac{1}{2}$	— 2
	Ridges and hips rounded for lead	$1\frac{1}{4}$	— 8
	$\frac{1}{4}$ in. yellow deal slate-battens $2\frac{1}{4}$-ins. wide		
	Binding-joists	9	— 3
	Ceiling-joists spiked in one length (without scarfing) beneath the binding-joists	$2\frac{1}{2}$	— $1\frac{1}{2}$
	Strong fillets to receive the ends of the ceiling-joists next the walls.		
Roofs over the warehouses above the two principal gateways.	3923. Wall-plates	4	— 4
	Rafters	4	— 2
	Ridges and hips rounded for lead	8	— $1\frac{1}{4}$
	Ceiling-joists	5	— 2
	$\frac{1}{4}$ in. yellow deal slate-battens $2\frac{1}{4}$-ins. wide.		
Roof over the cart house, two-stall stable, and vat.	3924. Wall-plate	4	— 4
	Two tie-beams	9	— 3

[redacted]

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	Ins.	Ins.
Angle-ties each 5 ft. long	6	— 2½
Dragon-pieces to ditto each 3 ft. long	6	— 2
Rafters	5	— 2½
Ridge and hips rounded for lead	8	— 1¼

¾ in. yellow deal slate-battens 2¼-ins. wide.

ners. 3925. To put over each of the principal warehouse-buildings a dormer complete as shown by the drawings, with quarters 3½-ins. by 2½-ins., rafters 3 ins. by 2 ins., ridge 6 ins. by 1 in., slate-battens all over, ¾ in. boards 10½-ins. wide all round to receive the lead flashings, ¾ in. proper ledged internal and external trap-doors hung with strong hinges and fastenings and with all requisite stops linings and appertenances complete.

ers. 3926. To fit up all the roofs (not hereinafter described to have iron gutters) with 1 in. yellow deal gutter-boards and bearers clear of sap-wood, laid to a current not less than 1½-in. to every 10 ft. in length, and with 2½-in. rebated drips in the situations shown by the plans, and where the drips are not shown they are not to be more than 16 ft. apart. The gutter-bottoms are to be in no instance less than 10 ins. wide in the very narrowest part thereof. To put to all the gutters which may so require ¾ in. lear-boards full 10½-ins. wide. A cess-pool is to be formed in the gutter at the head of each of the rain-water-pipes.

at-summers, , &c. to cart. s. 3927. To put to the fronts of all the cart-sheds fir wrought and framed breast-summers, scantling 12 ins. by 12 ins. fir wrought and framed posts, 6 ins. by 12 ins., and wrought, framed, and shaped fir corbeille-templets, of the lengths shown by the drawings.

s to the two cipal ances. 3928. To construct and hang complete, two pairs of folding-gates to the principal Western entrances according to the drawings, to hold 3½ ins. thick when finished, with styles rails and muntins of 1 in. deal, and 3 in. deal in two thicknesses, secured together by nuts and screws with ornamental heads, 1 in. deal braces, 1 in. deal panels bead-flush at the back, and mouldings, margins and capping according to the profiles.

Each pair of gates is to have hinges and fastenings, value 12*l.* exclusive of the fixing and hanging thereof.

	Ins.	Ins.
s on the nd-story ing into the houses. 3929. Fir wrought framed and rebated heads, each 10 ft. long...	12 by	14
Fir wrought framed and rebated posts let at bottom into the iron sockets	4½ —	9

Folding gates hung complete with 2-in. deal framed margins, and 1 in. deal braces, filled in with 1 in. tongued and beaded battens, each pair of gates is to be hung with hinges and fastenings value 5*l.* exclusive of the hanging and fixing thereof.

p-hole door- s in the tern front. 3930. Folding 2½ in. deal moulded-doors, with 1¼ in. beaded-panels according to the drawings (or 1¼ in. batten-doors, as the case may be), hung complete in proper rebated frames, with fir posts 6 ins. by 6 ins., heads of 2½ ins. deal, fixed under the wall-

plate, and oak-framed mitred moulded and sunk sills 16 ins. by 3½ ins.

Loop-hole doorways to all the remainder of the building.

3931. Folding 1¼ in. deal, proper strongly ledged and braced doors, hung complete in proper rebated fir frames 5 ins. by 5 ins., with oak-framed mitred moulded and sunk sills, those of them to the lower doors to be scantling 12 ins. by 3½ ins., and those to the upper doors to be scantling 8 ins. by 3½ ins.

To put between the upper and the lower loop-hole doors 1½ in. moulded paneling, as shown by the drawings.

Each pair of loop-hole doors, of every kind throughout the premises, is to have hinges and fastenings value 25*s.* exclusive of the fastening and hanging thereof.

External doorways of the warehouses.

3932. To fit up all the external doorways on the ground story of the warehouses, with fir proper door-cases, 5 ins. by 4 ins., with oak sills 4 ins. by 3 ins., and tongued beaded and braced doors filled in with 1 in. battens; each door is to be hung with hinges and fastenings, value 20*s.* exclusive of the fixing and hanging thereof, and is to have a fir transom 4 ins. by 3 ins. with a 2-in. bevil-bar fan-light over the same.

Stable door-ways.

3933. To fit up all the stable-door-ways, of every kind throughout the buildings, with fir proper door-cases, scantling 5 ins. by 4 ins., let at bottom into the granite sills, with a piece of 4 lb. milled-lead in each mortise-hole dressed up 6 in. all round the foot of each door-post, and 1¼ in. proper ledged and braced doors, hung complete with hinges and fastenings to each door-way, value 15*s.*, exclusive of the fixing and hanging thereof; each stable door-way is to have a transom 4 ins. by 3 ins., and iron-bars 1 in. square placed diagonally not more than 4 ins. apart, reaching from the transom to the head of the door-case.

Hay-loft doorways.

3934. To fit up all the door-ways of the hay-lofts with ¼-in. deal ploughed tongued and beaded ledged doors hung complete in fir proper door-cases 5 ins. by 4 ins. with oak sunk sills 10½ ins. by 2½ ins. with hinges and fastenings to each value 10*s.* exclusive of the fixing and hanging thereof.

Entrance gates to the private yards.

3935. To put to each of the private yards or office-courts a pair of 1¼ in. deal ploughed tongued beaded ledged and braced gates, with moulded cappings, and hung with hinges and fastenings complete (value £3 exclusive of the fixing and hanging thereof) to a pair of English oak wrought and rebated posts 9 ins. square and 12 ft. long with an oak weathered and throated capping and 3 spurs of English oak 5 ins. by 4 ins. and 3 ft. long to each post the posts are also to be secured by an oak sill 9 ins. by 6 ins.

Entrance next

3936. To provide and hang complete a pair of folding-gates flush on both sides, with 2-in. framed tongued and beaded style and rails, 1¼-in. braces, and 1¼-in. back middle rails, filled in with two thicknesses of tongued and beaded battens, and finished on the top with moulded and grooved capping.

To provide and hang complete, two doors for the side postern, corresponding in description with the centre gates, and with fir proper circular headed door-cases scantling 6 ins. by 5 ins.

The centre pair of gates and the two side postern-doors a

to have hinges and fastenings of the total value of £10 exclusive of the fixing and hanging thereof.

Panelled doors and fittings.

3937. To fit up all the doors of every kind to every part of all the intended buildings throughout the whole establishment where not otherwise shown by the drawings or otherwise directed by this specification, with four-panel doors with 2-in. deal styles rails and muntins and ¾-in. deal panels; each door is to be hung with hinges and fastenings of the average value of twelve shillings exclusive of the fixing and hanging thereof, in 1¼-in. single-rebated linings, with mouldings round the same to form architraves.

Chamfered-bar sashes and frames.

3938. To fit up all the remainder of the windows of every kind throughout the whole of the buildings (except those in the West front to the lower warehouses which are intended to have iron sashes) with 2-in. deal chamfered-bar sashes double hung with large patent spring fastenings in deal cased-frames with English oak double-sunk sills.

Boarded and braced partitions.

3939. To inclose the stair-cases of the warehouses with boarded and braced partitions, consisting of 2-in. yellow deal and 1-in. yellow deal, with framed heads and solid rebates for the doors. The partition round each stair-case which has no external window thereto is to be framed with a chamfered-bar sash 4 ft. square therein at each story.

To put in and about the various parts of the intended buildings, as shown by the drawings, the requisite partitions with styles rails and muntins of 2-in. deal, and panels of ¾-in. deal where any other description of partitions are not shown by the drawings or are directed by this specification.

Square skirtings.

3940. To put to all the counting-houses ¾-in. deal square skirtings 8 ins. high plugged to the walls.

Warehouse stair-cases.

3941. To construct stair-cases to all the warehouses according to the drawings, with 1½-in. deal treads and landings, 1¼-in. deal risers, 1½-in. deal string-boards and wall-strings, very strong bracketed fir carriages, framed and chamfered newels 3½-ins. square, framed and rounded hand-rails 3 ins. by 3 ins., with diagonal braces 2 ins. square instead of balusters, and all requisite linings furrings blocks and other fittings complete.

Stable-fittings, &c.

3942. To fit up all the stables of every kind throughout the intended buildings of the establishment, with 1¼-in. tongued mangers with oak grooved and rounded top-rail 4 ins. by 3 ins., and all requisite brackets bearers manger-rings and other proper fittings.

To put to the loose-box-stable, a fir rounded moveable stall-bar 4 ins. by 2½ ins. hung with a strong iron chain and proper hooks and staples thereto complete; and to put to all the other stables throughout the buildings 1½-in. ploughed tongued and beaded stall-boards, with 2½-in. oak grooved bottom-rails 9 ins. high, oak grooved and rounded top-rails 4 ins. by 3 ins., and 1¼-in. deal rounded middle-rails 6 ins. wide.

To put for each stall and for each horse throughout the whole of the stabling a large full-sized cast-iron hay-rack fixed complete.

To put a strong step-ladder to each hay-loft, in order to ascend thereto from the story below.

Best privies.

3943. To fit up the best privies, with 1¼-in. deal seats and risers with strong bearers, 1¼-in. deal clamped flaps and beaded frames, 3-in. brass hinges, ¾-in. deal skirting 4½ ins. wide over the seats, ¾-in. deal skirting 8 ins. wide round the floors, and 1¼-in. yellow deal floors on fir joists 4½ ins. by 2 ins., and oak sleepers 4½ ins. by 3 ins.

Labourers' privies.

3944. To fit up the privies for the labourers at the with 2-in. deal grooved and tongued fronts capped with grooved and rounded oak 4 ins. by 3 ins.

100 ft. cube extra fir timber.

(See § 1071.)

Jobbing-work.

3945. To perform to the whole of the warehouses buildings and premises all such carpenter's work and joiner's work as may be necessary thereto in the nature of jobbing.

SMITH.

Wrought-iron chimney-bars.

3946. To put to each of the fire-places throughout all the intended buildings, a wrought-iron chimney-bar 2½ ins. by ½ in.; each of the chimney-bars is to have proper corkings at the ends thereof.

Stirrup irons, &c. to the roofs.

3947. To put to each of the queen-posts of all the trusses and return-trusses of all the eleven principal roofs over the warehouses, a stirrup turned up out of a piece of wrought-iron 2½ ins. by ¼ in., and 6 ft. 6 ins. long, with two bolts, and with keyed wedges thereto complete.

Bolts to the feet of the principals.

3948. To put through the foot of each of the principal rafters of the trusses, and through each end of the tie-beam beneath the principal rafter, a ¾ in. bolt of wrought-iron, with nut and washer thereto complete.

Cast-iron heel-posts.

3949. To put in the stables, eleven cast-iron heel-posts 4½ ins. diameter at the bottom, and 3¾ ins. diameter at the top, with plate-bases to be laid flush with the pavings, equal in substance to 8 ins. square by 1½ in., each heel-post is to be cast with a groove to receive the end of the stall-board.

28 cast-iron modillion-gutters to the cornice of the centre-piece of the principal façade.

3950. To provide and fix in the cornice over the Tuscan pilastrade, of the centre-piece of the principal or Western façade of the buildings, twenty-eight modilions as shown by the drawings, cast hollow like troughs, with proper currents to convey the wet from the projection of the cornice quite back into the gutters of the roofs of the warehouses, each of the modilions is to be carried back beyond the inside of the brick-work, in order to counterpoise and to give the projecting cornice all possible support.

18 cast-iron sashes to the lower warehouses.

3951. To provide and fix to each of the eighteen lower West

windows of the front warehouses, a cast-iron sash according to the drawing No. .

66 cast-iron bases to the wood story-posts. (See § 1282.)

3952. To provide and fix sixty-six cast-iron bases for the story-posts of the warehouses, according to the drawing No.

C. View.
d. Plate-base.
e. Sides of the socket.
f. Mortise for the insertion of the timber.

26 cast-iron sockets for the gate-posts of the lower warehouses.

3953. To provide and fix twenty-six cast-iron sockets for the lower ends of the gate-posts of the warehouses on the ground-story, according to the drawing No. .

16 cast-iron sockets for the gate-posts of the cart-sheds.

3954. To provide and fix sixteen cast-iron sockets for the feet of the gate-posts of the cart-sheds, according to the drawing No. .

Copings to dung-pit walls.

3955. To put all along over each of the dung-pit breast-walls, a coping of cast-iron, not less than half-an-inch in thickness in every part thereof.

Wrought-iron doors in the party-walls. (Cast-iron is not allowed by the Building-act.)

3956. To provide and fix in the party-walls, No. pairs of wrought-iron folding-doors of the very best quality, made according to the drawing No. , and with hinges and fastenings complete, each pair of doors with the fittings and fixing thereof to be in value not less than 25*l*.

Gully-hole gratings.

3957. To provide and fix in the paving of the courts twenty-four cast-iron gully-hole gratings, each in weight not less than 2 cwt.

20 cwt. of cast-iron and 20 cwt. of wrought-iron ties, &c. in addition. (See § 1703.)

3958. To provide under the contract 20 cwt. of iron, in such cast-work, and 20 cwt. of wrought-iron in such ties bolts stirrups and other wrought-iron-work, with fixing complete, as the architect may direct; the value of the whole, or of such part of the cast-iron, and of the wrought-iron so provided, is however to be deducted from the amount of the consideration of the contract, if not by the architect directed to be used, after the rate of per cwt. for every cwt. of cast-iron, and at the rate of per lb. for every lb. of wrought-iron, including the fixing thereto.

Patterns, &c.

3959. The smith is to have made, and is to provide all requisite patterns for the execution of the cast-iron-work and smith's-work, to the satisfaction of the architect, for the time being of and he is to file, chip, clean off, fit up, and render complete all the cast-iron work of every kind.

PLUMBER.

6½ lb. milled-lead gutters.

3960. To lay all the gutter-boards (to be prepared as described in the carpenter's work and joiner's work) throughout the whole of the intended buildings with milled-lead weight 6½-lbs. to the foot superficial, lapped sufficiently at all the drips and rolls, and turned up on each side so as to meet a line drawn 5 ins. in perpendicular height above the gutter-bottoms.

3961. To put over each of the rain-water-pipes a very strong hemispherical lead rose to prevent stoppage of water.

6½ lb. milled-lead valleys.

3962. To lay all the valleys with milled-lead 6½ lbs. to the foot superficial not less than 20 ins. wide.

4 lb. milled-lead flashings.

3963. To put flashings of 4 lb. milled-lead 5 ins. wide to all the gutters on the sides thereof next the brick-work, and also over the pole-plates and gutter-plates of all the parallel gutters.

4 lb. milled-lead to the hips and ridges.

3964. To cover all the hips and ridges throughout all the intended buildings with milled-lead weight four pounds to the foot superficial and 16 ins. wide properly dressed round the rolls, and secured by lead-headed nails.

5 lb. milled-lead step-flashings.

3965. To put to all the parts of the roofs which rake against brick-work of any kind throughout all the buildings 5 lb. milled-lead step-flashings of an average width not less than 16 ins.

Pipes to stone cornice.

3966. To put from each of the front stone cornices over the two principal gateways, a strong 3-in. lead pipe to convey the water from the sunk top of the cornice back into the lead gutter behind the same.

Dormers.

3967. To cover the ridges of all the dormers with 4 lb. milled-lead 16 ins. wide, and to put all round the four sides of each dormer 5 lb. milled-lead flashings 15 ins. average width.

Rain-water-pipes. (See § 1104.)

3968. To provide and fix the following complete stacks of cast-iron rain-water-pipes with heads and shoes leading into the funnels of the drains :—

Six complete stacks to the minor offices 2½-ins. bore.
One complete stack to the office-buildings 3 ins. bore.
Seven complete stacks to the office-buildings 4 ins. bore.
One complete stack to the office-buildings 5 ins. bore.
Four complete stacks to the principal buildings 6 ins. bore.

4-in. cast-iron eaves'-gutters.

3969. To put round all the eaves of all the buildings throughout the whole of the establishment, which are not intended to have leaded gutters, 4 in. cast-iron eaves'-gutters, securely fixed with strong brackets to proper currents, and with the joints thereof set in white-lead.

10 cwt. milled-lead labour, &c. extra. (See § 2741.)

3970. To provide under the contract, ten hundred weight of milled-lead, including the labour of laying, and all materials complete, to be used in such extra works as the architect may direct to be done, the value of such portion thereof as may not be directed to be used, is however to be deducted from the amount of the consideration of the contract, after the rate of
per hundred weight.

CHAPTER XXXVIII.

PAINTER.

5 times in oil to iron-work.

3971. To paint five times with the best oil-colour all the iron-work of every kind of the intended buildings and works of the whole establishment; the first two coats of colour to the whole of the iron-work are to be done with red-lead colour.

4 times in oil to wood-works, &c.

3972. To paint four times with the best oil-colour all the internal and external wood-works and other wood-works of every kind usually painted of the buildings and of their fittings and appertenances throughout the whole of the establishment.

No part of the timbers of the floors and roofs of any of the buildings are required to be painted.

Preparation, stopping, knotting, &c.

3973. The whole of the works of every kind intended to be painted are to be properly prepared, pumiced smooth, stopped, and knotted; all the iron-work is to have the rust which may come thereon removed effectually by scraping and burning the same before the paint is laid thereon.

GLAZIER.

3rd glass.

3974. To glaze all the windows and lights of the warehouses and of the remainder of all the other intended buildings of every kind of the whole establishment, with good third Newcastle crown glass.

3975. The whole of the glazing is to be properly bedded, bradded, and back-puttied; and the whole of the glass throughout all the buildings is to be cleaned and left perfect in every respect at the final rendering up of the whole establishment as complete.

CHAPTER XXXIX.

SPECIFICATION OF THE ARTIFICERS' WORKS *to be done in the erection of a* WAREHOUSE-BUILDING ONE STORY HIGH, AND CLOSELY SURROUNDED BY OTHER BUILDINGS, *on part of the premises situate and adjoining to , and for the performance of other works therewith connected.*

(Insert here list of the Working-drawings, see § 986.)

BRICKLAYER.

Notice &c. to the District-surveyor, &c. *(By the 8 § of the London Building-act, warehouses from 13 ft. to 22 ft. high from the ground to the parapets and not more than two stories high above ground are constituted of the 3rd rate, and by 53 §. of the same Act warehouses are limited in extent to 35 squares of building on the ground plan thereof, but warehouses may communicate together by wrought-iron doors in stone door-cases.)*

3976. To give to the District-surveyor the requisite notice for the erection of a third-rate building; to give to all the other proper officers the requisite official notices, to obtain all requisite official licenses for the building, and to pay to all public officers their proper official fees due in respect of the intended buildings and works.

Digging, &c.

3977. To remove from the site of the intended works, all the old materials and rubbish now lying thereon. To excavate and level the ground as may be found requisite in order to execute the brick-work and otherwise to complete the building according to the design and drawings thereof; and to cart away from the premises all the superfluous ground earth rubbish and refuse materials, and to leave the premises finally clear therefrom.

Taking down and repairing.

3978. To take down the old privy and the shed and the walling behind the house No. as far as may be requisite in order to carry into execution the intended works.

3979. To take down to one level the wall on the west side of the premises next other premises situate in ; to cut out and remove from the same walling all the defective parts thereof; to repair and stop with sound stock-bricks all the holes and defects in the same walling; and to rake out and point in a workmanlike manner all the remainder of the same walling.

Wall next

3980. To take down the walling next as low as the public paving at the west end of the said walling, and to rebuild the said walling with new brick-work 10 ft. in height and 9 ins. thick, extending from the back front of the house No. quite to the south-western angle of the site of the intended new buildings.

3981. To take down the wing-wall at present over the gateway entering upon the site of the intended buildings; and to repair, stop, rake out the mortar from the joints thereof ¾ in. deep, and point in a workmanlike manner the whole of the old ware-

house-wall adjoining to the northern side of the site of the intended new buildings.

General brick-work. 3982. To execute in a proper and workmanlike manner, all brick-work which may be requisite for carrying into effect the intended buildings and works according to the drawings, and so as to render the said buildings and works complete in every respect.

Arches, &c. 3983. To turn rough arches where requisite to the several parts of the intended buildings; to put to the external openings of the brick-work axed arches tuck-pointed.

Chimney. 3984. To erect from the foundation of the new warehouse, and in the situation shown by the plans, a flue with an external shaft carried up 3 ft. high above the old wall against which the same is to be built, finished with salient-course 6 ins. high, and a first-sized chimney-pot set in and flanched round with plain-tiles, with Parker's cement and Thames sand mixed together in equal measures; to parget and core properly the inside of the said flue; and to secure to the old building the shaft of the said flue by means of two strong girths or ties of wrought-iron, through which the chimney may subside, each weight 14 lbs. at the least, and with their ends carried through the old wall, and secured from drawing out of the same by a nut and a washer of wrought-iron upon each end of each iron tie.

Cutting, &c. 3985. To perform such cutting to the brick-work as may be necessary; and to cut and parget perpendicular indents in the old brick-work wherever may be requisite for receiving the intended new work.

Bedding, &c. (See § 999.)

Brick piers under the sleepers. 3986. To build for the support of the sleepers of the ground-flooring of the intended warehouse, brick piers not more than 3 ft. apart, each consisting of one course of brick-work 13½ ins. square and two courses of brick-work 9 ins. square.

Old privy. 3987. To alter as shown by the plan, the entrance into the old privy by the north-west corner of the intended new buildings, and to repair thoroughly and make good the brick-work therewith connected.

Drainage. 3988. To open, cleanse, repair thoroughly, and make good all the drains and water-courses at present upon the site of the intended buildings; to form a new 12-in. barrel-drain from the intended new privy to the present old privy; and to stucco over the inside of the lower half of the said drain with pure Parker's cement ¾ in. thick; to put to the new privy and to the foot of each of the intended rain-water-pipes, a brick funnel set in Parker's cement, and to put to each of the two sink-stones a brick stench trap set in Parker's cement.

Work in Parker's cement. 3989. To finish all the intended new yard-walls with brick-on-edge bedded and jointed in Parker's cement and clean Thames sand mixed together in equal measures; and to finish all the other intended new walls with brick-on-edge and double plain-tile cresting bedded and jointed as the last described.

See § 1007.)

1. (See §

3990. In the performance of the brick-work the contractor is to be allowed to use (after he has properly cleaned the same) such of the present old bricks remaining on the premises as are sound and fit to be again used, and he is to provide new hard-burnt square grey stock-bricks of the very best quality sufficient for facing all the external work, and to make up all deficiency in the quantity of the bricks.

Mortar.

(See § 1009.)

n of doing rk. (See 0.)

3991. No four courses of work are to rise more than one inch besides the height of the bricks ; the whole of the work is to be carried up throughou[redacted]ole thickness thereof in English bond without any of the [redacted] bricks being broken off on any pretence whatever. A[redacted]ernal joints of the work are to be struck fairly ; the whol[redacted]ternal work is to be neatly faced with picked stocks of a[redacted]olour, and is to have all the joints thereof correctly drawn.

Scaffolding. (See §§ 2060—2.)

3992. To provide an[redacted] the performance of all the works of every kind intended to b[redacted] under this specification, sufficient scaffolding complete with [redacted] and all proper appertenances, and finally to take down remove and carry away from the premises the whole thereof.

Lime-whiting.

3993. To stop and lime-whiten twice the whole of the internal brick-work of the intended warehouse-building and the internal brick-work of the yard thereto attached.

Plastering.

3994. To render, set, and colour the internal brick-work of the intended new privy.

Jobbing-work.

(See § 1011.)

MASON. (See §§ 265—295.)

4-in. Yorkshire stone to foundations.

3995. To provide and bed under the foundations of the posts supporting the lantern-light, four pieces of 4-in. Yorkshire stone each 2 ft. 6 ins. square.

Paving, &c.

3996. To take up the present paving of the small yard behind the house No. , to square and relay the same in regular courses, and to provide sufficient new 2½-in. Yorkshire stone, and to pave therewith in regular courses the additional portion of the yard intended to be added to the house No. and the small inner yard attached to the new privy intended to be erected next .

3997. To provide and fix as shall be directed two five-hole sink-stones.

Step.

3998. To put at the Southern doorway of the intended new warehouse-building a solid Yorkshire stone step 7 ins. by 13 ins., properly back-jointed.

SLATER. (See §§ 542—3.)

3999. To slate the whole of the roofs over the intended warehouse-building and the lantern-light thereof, and over the intended new privy, with the very best countess slates, securely fixed with copper nails, and with proper bond in every part thereof, more particularly at the eaves and at the heading-courses thereof, instead of having (as commonly is the case) slates laid lengthwise with narrow slips of slate between them.

4000. To make good to the satisfaction of the surveyor all damage which may during the progress of the works occur to the slating, and to leave finally perfect the whole of the slating.

CARPENTER and JOINER. (See §§ 337—40.)

New materials, &c. (See 1029—30.)

Timber and deals. (See § 1031.)

Sundries. (2 cwt. iron-ties, &c.) (See § 1032—3, and 1703.)

Centering.

4001. To provide, fix, ease when directed, and finally remove the centering requisite for turning the arches of every kind.

Bond-timber.

4002. To put all round the walls of the intended new warehouse-building and round the walls of the intended new privy, two complete tiers of fir bond-timber scantling 4 ins. by 2½ ins. properly lapped and spiked, and in as long pieces as possible.

Roofing, &c. (See § 1282.)

C. View.
d. Plate-base.
e. Sides of the socket.
f. Mortise for the insertion of the timber.

4003. To construct the roofing of the warehouse-building according to the drawings, supported on four wrought fir-posts 8 ins. square, each post having at bottom thereof a cast-iron socket-shoe weight 28 lbs. at the least, and being reduced from the tie-beams upwards to scantling 6 ins. by 6 ins., so as to serve as corner-posts to the lantern; to put across the warehouse-building, four wrought fir tie-beams 12 ins. by 5 ins., to be halved and wedged together where the same meet and rest upon the shoulders of the four posts, and to form as well tie-beams to the roofing as also a curb to support the lantern-light; to put to the whole of the intended roofing, wall-plates for receiving the small rafters 4 ins. by 3 ins., rafters 3 ins. by 2 ins., valley-pieces 4 ins. by 2½ ins., hips and ridges rounded for lead 1 in. by 6½ ins., and ¾-in. yellow deal close slate-boarding clear of sap-wood; and to put to the lantern-light a fir wrought and framed plate 6 ins. by 6 ins., and rafters, hips, and

slate-boarding the same as described to the other parts of the roofing; to put under all the hips of the roofing, angle-ties each 3½ ins. by 3 ins. and 5 ft. long, with dragon-pieces of the same scantling.

The whole of the timbers, boarding, and wood-work, of the roofing, are to be planed smooth.

Lantern-windows, &c.

4004. To fit up the lantern-light, with oak sunk sills with blocks framed from the under-side of the same into the four tie-beams, and lined on the inside with inch deal wrought and tongued linings, and on the outside with ¾-in. deal to receive the lead flashing; to put to the lantern-light eight 1½-in. yellow deal sashes fixed with beads, and four pairs of 1½-in. yellow deal sashes double-hung in proper deal cased-frames with large patent lines brass axle-pulleys and iron weights; and to provide a proper implement for readily opening and shutting the windows.

Gutters.

4005. To lay to the roofing, inch yellow deal gutter-boards on strong fir bearers to current 1½ in. in every 10 ft.; with 2½ in. drips, and with cess-pools over the rain-water pipes.

Flooring.

4006. To construct the flooring of the intended warehouse-building with fir joists 5 ins. by 2½ ins. on oak sleepers 5 ins. by 3½ ins., and to lay the joists with 1½ in. yellow deal clear of sap-wood.

(In this flooring occurred one of the only two instances in which the author has seen any rot occur in any wood-work used by him. From an alteration to suit the views of the proprietor, the floor was set lower than was originally intended, and the drainage being so imperfect as for the drain itself to lie partly above ground, water flowed among the timbers of the flooring; moreover, the floor, under an idea of preserving it, was for a considerable space covered over with plate-iron: thus damp and want of ventilation operating together, in three years caused a piece of flooring, about 30 ft. by 7 ft., so covered over with iron, to rot completely: it was immediately replaced by paving of smooth or dressed granite.)

Doors.

4007. To put to the intended new buildings fir proper door-cases 4 ins. by 4 ins., with oak sills 4 ins. by 3 ins., and 2-in. four-panel bead-butt and square doors hung with 4-in. butt hinges, and with fastenings to each door value 10*s.* exclusive of the fixing thereof.

To remove, repair, refix, and make complete, the door and the door-case in the wall next

Privy-fittings.

4008. To fit up the intended new privies, with 1¼-in. yellow deal flooring upon fir joists 3½ ins. by 2 ins., inch deal risers seats and clamped flaps and frames, the flaps hung with 2½-in. butt-hinges; and to put round the privies and over the seats of the same, ¾-in. deal skirting 4½ ins. high, plugged to the walls.

To repair and make good the wood-work of the old privy by the North-western corner of the site of the intended new buildings.

Jobbing-work.

(See § 1070.)

25 cubic feet extra fir timber.

(See § 1071.)

APTER XXXIX.

PLUMBER.

milled-lead rs, &c.

4009. To lay the whole of the gutters, cess-pools, and valleys, with milled-lead weight 6½ lbs. to the foot superficial, turned up full 10 ins. all round next the raking parts of the roofing, and full 5 ins. high round the brick-work and next the lantern-light.

milled-lead ıs, ridges, antern-light.

4010. To cover all the hips and ridges of the roofing, with milled-lead weight 4 lbs. to the foot superficial and 16 ins. wide, properly secured and dressed; to put all round the foot of the lantern a flashing of 4 lb. milled-lead of sufficient width dressed down over the lead-work of the gutters, and extending over the window-sills and within the lantern-light quite up behind the bottom rails of the sashes.

PAINTER.

es in oil to -work.

4011. To knot, stop, prepare properly, and paint four times with the best oil-colour the whole of the external wood-work of every kind of the intended warehouse-building, and of the other works and appertenances; and to paint in like manner all the insides of the doors and door-cases and of the sashes and frame-work of the lantern-light.

es in oil to vork.

4012. To paint five times with the best oil-colour, all the iron pipes and other iron-work of every kind of the whole buildings and of the other works and the appertenances thereof.

The whole of the painting is to be finished of such plain colours as the surveyor may direct.

GLAZIER.

4013. To glaze the sashes of the lantern-light with good third Newcastle crown-glass, properly bedded bradded and back-puttied.

CHAPTER XL.

SPECIFICATION FOR REPAIRING A WAREHOUSE situate at and belonging to

BRICKLAYER.

(See No. 987.)

Notice, &c. to District-surveyor, &c.

Digging and carriage.

4014. To excavate the ground to a depth sufficient for the performance of the intended under-pinning; to fill in again, ram down and consolidate the ground after the under-pinning is performed; and to remove and cart away all superfluous ground.

Rubbish.

(See No. 989.)

Under-pinning wholly in Parker's cement.

4015. To underpin in the most careful manner the whole of the walls of the warehouse with brick-work wholly consisting of the very best sound hard well-burnt approved grey stock-bricks (*or paving-bricks as the case may be*) set and entirely bedded in and flushed up at every course of the work with the best new quick Parker's cement and clean river (*Thames*) sand mixed together in equal measures; the said new brick-work so under-pinned being ft. ins. high, and ft. ins. thick, besides having below the same two courses of similar brick-work ft. ins. thick, two courses of similar brick-work ft. ins. thick, two courses of similar brick-work ft. ins. thick, and two courses of similar brick-work ft. ins. thick; and in addition to the said under-pinning, to remove all the defective parts of the walling above the said under-pinning; and to pin in, wedge up, and consolidate between the said under-pinning and the remainder of the old brick-work similar new brick-work also set in Parker's cement and sand in the manner last described sufficient to repair complete and support effectually the said walling.

Reparation of settlements with brick-work in Parker's cement.

4016. To cut out the shattered broken and defective brick-work of the settlements in the and the walls and all the other settlements in the brick-work of the warehouse, and to repair pin in and make good with new brick-work thereto set in Parker's cement as already described for the under-pinning.

4017. *If settlements in walls be nearly perpendicular, it is well to insert a cross bar of iron 3 or 4 ft. long at every 4 or 5 ft. in altitude of such fractures, in order to re-unite as far as possible severances so bad.*

Iron ties.

4018. To provide and insert in the brick-work four wrought iron ties each 1¼-in. diameter and extending from North to South quite through from the back to the front of the building, and with a wrought-iron plate 12 ins. square, a washer, and a nut at each end of each tie.

To make good the brick-work with Parker's cement and sand as above described to all the ties where the same are inserted in the brick-work.

New parapets. 4019. To take down the parapets of the warehouse and the brick-work beneath the same to the depth of ft. ins. below the copings, to clean all the bricks taken therefrom which will remain sound undecayed and unbroken; and to rebuild the said parapets and other brick-work, using only such of the old bricks as are above directed to be cleaned, and providing new sound hard well-burnt grey stock-bricks sufficient for making up all deficiency in the quantity of the bricks.

Repairs, pointing, &c. 4020. To rake out ¾ in. deep all the mortar from the joints of the external brick-work of all the external walls, and of the and walls of and of the ; to cut out from all the said recited brick-work, all the decayed or otherwise defective bricks; to repair all the said recited walls with the requisite new sound hard well-burnt grey stock-bricks, and to point entirely the whole of the said recited brick-work with the very best stone-lime blue mortar, with smith's ashes therein.

Tile-cresting, &c. 4021. To cover the walls with new brick-on-edge, and new double plain-tile cresting, both set in and jointed with new quick Parker's cement, and river (*Thames*) sand, mixed together in equal measures.

Tiling (if any). (See Index.)

Internal pointing. 4022. To repair thoroughly with the requisite new stock-bricks, the internal brick-work of the warehouse; and to rake out all the loose and defective mortar from the joints in the internal brick-work of the warehouse (to not less than one half of the superficial quantity of the brick-work), and to point the said brick-work with new stone-lime mortar.

Lime-whiting. 4023. To clean thoroughly, and lime-whiten twice, the whole of the internal brick-work, and the whole of the interior timber-work of the roofing and floors, the upper sides of the floors only excepted.

MASON. (See §§ 265—95.)

Yorkshire stone below the under-pinning (if any). (See § 2913, 3654, and 3856.)

Old copings. (See Index.)

New copings. (See Index.)

Paving. 4024. To relay and make good all the pavings disturbed by the under-pinning, and the performance of the other works.

SLATER. (See §§ 542—3, and Index.)

CARPENTER and JOINER.
(See §§ 387—40, 1029—33, and 1070—1.)

4025. To repair thoroughly all the timber-work and wood-work of the roofing; to take out the present insufficient purlins, and to put in lieu thereof new purlins of fir scantling, 8 ins. by 5 ins.; to put thirty feet run of new fir wall-plate; to put twenty feet run of fir-pole plate; to put 240 ft. run of new fir rafters; to put one entire new fir-framed truss; to put to one of the old trusses a new tie-beam, and to one of the other trusses a new principal; to repair, refix, and make good and complete, the other wood-work of the roof as may be found requisite; to fir up with new yellow deal all the sunk rafters, and to put to the roofing entire new slate-battens (if the roof be slated), of inch yellow-deal 2½ ins. wide.

(See Index.)

(See Index.)

4026. To take up all the flooring of the upper story and of the ; to take out and remove all the timbers thereof, and to construct entire new flooring instead of the old flooring with No. girders of fir scantling 15 ins. by 12 ins., and new joists of fir scantling 9 ins. by 3 ins., not more than 11 ins. apart; to lay the whole of the said story with a new entire boarded flooring of 1½-in. yellow deal listed free from sap-wood wrought on the edges ploughed and tongued with wrought iron 1½ in. by $\frac{3}{16}$ in.

4027. To take up the whole of the boarded floor of the ; to wedge, fir up, and otherwise render level, the timbers of the same flooring; to take out all the unsound and otherwise defective timbers from the same flooring, and to reinstate and make the same good by timbers of new fir corresponding in scantling with the present timbers *(the particular defective timbers may be mentioned)*, and to relay and make good all the said boarded floors, using only the sound portions of the present boards which remain full 1½ in. thick, and providing and applying new 1½-in. yellow deal sufficient to complete the floors; the whole of this story is to be grooved and tongued with iron, as above described for the new flooring, and the quantity of new fir timber used in the flooring is not to be less than cubic feet, and the quantity of new 1½-in. yellow deal used in the same flooring is not to be less than feet superficial.

4028. To take up feet superficial of the other boarded floors of the warehouse, and to replace the same by a similar quantity of new 1½-in. yellow deal flooring, the same as last described; and in general to examine, repair thoroughly, and make complete, all the other timber and boarded flooring of the warehouse.

4029. To put three new story-posts of yellow fir (or of Eng-

lish oak as the case may be) and to set upright all the other story-posts which are out of perpendicular; and to wedge up with oak wedges the floors and other works lying above the said posts.

irs. 4030. To put from the ground-floor to the one-pair floor, new steps and landings of 1½-in. English oak cross-tongued, and risers of 1¼-in. yellow deal, upon strong bracketed fir carriages, and with 1½-in. yellow deal string-boards and wall-strings, framed and chamfered newels 3½ ins. square, framed diagonal-braces of fir 2½ ins. square to serve as balusters, inch yellow deal apron-linings, and all other proper and requisite work fittings and appertenances.

To put from the ground-story to the basement-floor a new framed step-ladder entirely of 1½ in. English oak.

To put to ten of the other steps, new treads of 1½-in. yellow deal, and to repair thoroughly and make good all the other woodwork of the stair-case.

ors, &c. 4031. To put to the a new 1¼-in. deal wrought beaded grooved crossed-tongued and strongly ledged and braced door, hung with a pair of strong 30-in. cross-garnet (*or hook and eye*) hinges, two strong 15-in. rod-bolts, a pair of strong wrought-iron dogs with wrought-iron sockets, and a 12-in. copper-warded lock.

To take down, unhang, repair thoroughly, and rehang with new hinges, the doors of .

To ease and repair all the other doors and the gates of the warehouse.

To take off, clean, repair thoroughly, oil, and refix, all the locks of the warehouse; to put thereto the requisite new keys, and to repair and make good all the other fastenings of the doors.

idows. 4032. To take out the present window of , and to put instead thereof a new window with sashes and frame hung and made complete to correspond with the present window.

To examine all the other windows of the warehouse, to repair thoroughly all the sashes and sash-frames, putting to ten of the sashes new bottom-rails; to put to the sashes twenty ⌊ and thirty T strong wrought-irons fixed with screws; to case over six of the wood sills with 1¼-in. yellow deal (*or English oak*) to rehang the whole of the sashes with the best new large patent lines (or with iron axes as the case may be).

PLUMBER. (See §§ 3044, and 3128—37.)

GLAZIER.

4033. To cut out from the windows all the glass which is broken with more than one simple crack, and to make good all the windows with the requisite new glass to correspond with the other glazing of the warehouse.

4034. To rectify throughout the warehouse all the old glazing of the windows thereof.

PAINTER.

4035. To clean, stop, prepare properly, bring forward with a sufficient number of coats of oil-colour, and paint three times all over with the best oil-colour all the internal and external wood-works and other works which were before painted.

4036. To knot, stop, prepare thoroughly, and paint four times with the best oil-colour, the whole of the new internal and external wood-works, iron-works, and other works usually painted.

4037. All the iron-work is to be scraped quite clean and free from rust; and the first two coats of paint thereon are to be done with red-lead paint.

CHAPTER XLI.

SPECIFICATION OF THE ARTIFICERS' WORKS *to be done in the erection of a range of* Workshops *at the premises* *for Mr.* *and other works therewith connected.*

(Insert here a list of the Working-drawings. See § 986.)

BRICKLAYER.

4038. To give to the District-surveyor the requisite notices for the erection of a third-rate building, and to pay him his proper official fees.

To obtain all requisite licenses from the Surveyor of pavements and other public officers, and to pay all official fees, dues, and charges of every kind attendant thereon.

4039. To excavate the ground for the basement-story of the intended building as shown by the drawings, and to excavate wherever else may be requisite for the foundations, drains, areas, and other works of the internal building; to beat down to a hard consistence the bottoms of the trenches for the reception of the brick footings; to fill in to the proper levels, make up, and render firm, the ground about the brick-work after the same is executed; and to remove and cart away all the superfluous earth and ground remaining after the levels are made up.

4040. To execute in a proper and workmanlike manner all brick-work which may be requisite for carrying into effect the

intended building and works according to the drawings, and so as to render the said building and works complete in every respect.

Arches, &c. (See §§ 570—94, and 3834.)

4041. To turn rough arches wherever requisite to the several parts of the intended building.

To put to the external openings of the building which have not external lintels or iron bearing-bars, neat axed arches tuck-pointed.

Chimneys.

4042. To properly turn, parget, and core all the flues; to put to each fire-place above the basement-story a 4-in. brick trimmer 18 ins. longer than the chimney-opening; and to put to the fire-place of the machine-room a 4-in. brick fender 12 ins. high.

4043. To carry up the chimney-shafts as shown by the drawings; to finish the same with salient-courses set in Parker's cement and Thames sand mixed together in equal measures; and to put over each flue a first sized chimney-pot set in Parker's cement and sand as the salient-courses.

Bedding, &c.

4044. To bed in mortar all the bond-timber, plates, lintels, wood-bricks, templets, and other timber-work so requiring; and to bed and point round with lime and hair mortar all the door-frames and window-frames.

Cutting, &c.

4045. To perform such chamfering and other cutting as may be necessary for the building and works according to the drawings, and so as to render the intended works complete.

Brick piers under sleepers.

4046. To build for the support of the sleepers of the machine-room, piers not more than 3 ft. apart, and consisting each of two courses of brick-work 9 ins. by 13½ ins., and two courses of brick-work 9 ins. by 9 ins.

Copper.

4047. To set in a complete and workmanlike manner the copper with fire-bricks, welch-lumps, and all other proper materials.

Under-pinning to area-wall.

4048. To under-pin with sound stock-bricks (closely jointed in mortar) to the full depth of 12 ins. below the intended paving and steps the breast-wall next , which is intended to form the wall of the new area and of the privy.

Drains. (See § 1104.)

4049. To construct from the intended new privy to the present principal drain of the premises, a barrel-drain of 4 in. brick-work and 14 ins. internal diameter; to construct from the feet of the intended two stacks of rain-water-pipe to the drain last described a barrel-drain 9 ins. diameter, with a proper funnel to each rain-water-pipe waste-pipe and sink-stone; to stucco over ¾ in. thick with Parker's cement and Thames sand in equal measures the inside of the lower half of the drains, and to fill in and make good to the drain-work the ground and all other things affected or disturbed by the formation thereof. To put to each of the two sink-stones an effectual stench-trap set in Parker's cement.

Jobbing, making good, &c.

4050. To perform such jobbing, cutting out, and making good

as may be requisite in order to complete the new building and to connect and adapt the same to the present buildings.

½-rod extra brick-work. (See § 1007.)

Bricks 4051. All the bricks (except where otherwise directed) are to be the best new approved hard-burnt square grey stock-bricks free from breakage and all admixture of soft bricks place-bricks or other inferior bricks.

Mortar. (See 1009.)

Mode of doing the work. (See §§ 353—65, and 1010.)

4052. The whole of the front next street and the whole of the end of the building next the dwelling-house are to be faced and formed in the neatest possible manner as shown by the drawings with hard picking-bricks of a pale uniform colour; the remainder of the external brick-work is to be finished with picked stocks of an uniform colour.

(Picking-bricks, though used for the facings of cheap buildings, are, from being the refuse of better facing-bricks, neither sound nor handsome.)

Scaffolding. 4053. To provide and fix for the performance of all the works of every kind intended to be done under this specification, sufficient safe and proper scaffolding complete with ladders and all proper appertenances, and finally to take down remove and carry away the whole thereof from the premises.

Rubbish, &c. 4054. To clear away from the building and premises from time to time as occasion may require, all rubbish and useless materials which may arise from the performance of the various works, and to leave finally the building and premises clear therefrom.

MASON. (See §§ 265—95.)

Paving and steps. 4055. To pave with Yorkshire stone not less than 2½-ins. thick in any part thereof and laid in regular courses, the whole of the sunk area next street, the area or external lobby between the dwelling-house and the intended new building, also the landing at the bottom of the internal basement-steps, also the intended new privy, and the whole of the floor of the dye-house.

Landing and steps. 4056. To put level with the top of the curb of the iron palisading next street and extending quite back to the entrance door-way of the intended new building, a tooled landing of 3½-in. Yorkshire stone joggled and run together with lead at all the joints therein, wrought and tooled fairly on the edges which are exposed, pinned in securely to the brick-work, and with holes cut out in order to receive the intended iron railing.

4057. To form in the basement-area the steps as shown by the drawings of 3 in. Yorkshire stone, wrought with fair tooled [illegible] and pinned into the brick-work.

CHAPTER XLI.

Covering to the new privy.

4058. To form a covering to the intended new privy, of one piece of 3 in. Yorkshire stone, pinned into the brick-work, laid sloping, throated, and tooled fairly in front.

Sinks.

4059. To put within the intended building the several sinks as shown by the plans, each of Yorkshire stone 7 ins. thick, securely fixed with the requisite bearers, and cut out to receive the pipes and bell-gratings.

To put in the paving of the , and in that of the area, two five-hole sink-stones, each sunk out of a piece of 4 in. Yorkshire stone 15 ins. square.

String and sills.

4060. To put below the level of the ground-story windows, a sill or string-course as shown by the drawings, to form an impost, composed of 3 in. Yorkshire stone 11 ins. wide, wrought fairly, throated, laid sloping, and plugged with lead at all the joints therein.

To put to the basement windows, sills of 3 in. Yorkshire stone 9 ins. wide, tooled fairly in front, throated and laid sloping.

Copings.

4061. To cover the front parapet, and the gable next the dwelling-house, with coping composed of 3 in. Yorkshire stone 13 ins. wide, tooled fairly on the edges, throated at back and front, and plugged with lead at all the joints therein.

Chimney-piece, hearths, and slabs.

4062. To put to the chimney of the intended counting-house, jambs mantle and shelf, each of 1¼ in. Portland stone 5 ins. wide; and to put to the same chimney a slab of 2 in. Portland stone, 3 ft. 6 ins. long, and 1 ft. 6 ins. wide.

4063. To put to each of the other fire-places, a hearth of 2½ in. rough Yorkshire stone, and a slab of similar stone 1 ft. 6 ins. wide, and 1 ft. 6 ins. longer than the chimney opening.

SLATER. (See §§ 542—3.)

Countess slating.

4064. To slate the roof and the dormer of the intended new building with the best strong countess slating, securely fixed with copper nails, pointed on the inside thereof with stone-lime mortar, with sufficient hair therein, and with proper bond in every part, particularly at the heading-courses and at the eaves thereof, having cut slates instead of as in the more usual mode, slates laid lengthwise with narrow slips of slate between them.

4065. To fillet the slating next all the brick-work with Parker's cement, strong cast-iron nails being first driven in not more than 3 ins. apart, in order to secure the same.

Reparation.

4066. To repair and leave perfect to the satisfaction of the Surveyor, all the slating at the final rendering up of the works as complete.

CARPENTER AND JOINER. (See §§ 337—40.)

(See .. 1029—30.)

(See .. 1031.)

(See .. 1032—3.)

4067. To provide, fix, ease when directed, and finally remove, the centering requisite for the arches and trimmers.

4068. To put round each story of the intended new building, a tier of fir bond-timber 4 ins. by 2½ ins. in as long pieces as possible, properly jointed and spiked; to put round the brick-work of the counting-house two additional tiers of similar bond-timber, and to put in the brick-work wood-bricks sufficient for fixing the various finishings.

4069. To construct a floor to every part of the machine-room, with fir joists 4 ins. by 3 ins. on fir sleepers not more than 9 ft. apart 4½ ins. by 3 ins., and to lay the whole of the same floor with 1¼-in. yellow deal planks listed free from sap-wood.

4070. To construct the floor of the ground story and that of the one-pair story, with wall-plates 4 ins. by 3 ins., jack-planed joists 9 ins. by 2¼ ins., jack-planed trimmers and trimming-joists 9 ins. by 2¼ ins., and to lay the whole of the same with 1¼-in. white deal planks; the floor of the counting-house is to be wrought on the upper side thereof, and all the flooring-boards except over the counting-house are to be jack-planed on the under side thereof and are to be also ploughed and tongued with wrought-iron 1 in. by ⅛ in.

4071. To construct the roof of the intended building according to the drawings, with wall-plates 4 ins. by 3 ins., four principties each 4 ft. long 4 ins. by 2 ins., four tie-beams 9 ins. by 4 ins., rafters 3 ins. by 2 ins., ridge rounded for lead 8 ins. by 1 in., slate-battens ¾ in. by 2 ins., inch yellow deal gutter-board with rise 2½ in. rebated drip and current 1½ in. to 10 ft. run, ¾ in. gutter-board 10 ins. wide, all requisite springers and tilting-fillets, and a dormer complete with frame-work inch ploughed tongued beaded and ledged door hung with strong cross-garnet hinges and screw bolts, ¾-in. battens for slates at the top and sides, and all requisite apron-linings and other proper fittings. The whole of the timber-work of the roof is to be jack-planed where within

4072. To fit up all the windows of the intended building, with yellow deal chamfered-bar sashes, double-hung in inch deal cased-frames with English heart of oak sunk sills with brass pulleys, iron axle-pulleys, large patent lines, and patent fastenings; and to put to each of the windows of the basement and ground-story, a cast-iron guard with top-rail and [illegible] by 1½ in., six upright bars set diagonally, and six [illegible] 6 ins. long.

[redacted]

HAPTER XLI.

rtitions. 4073. To divide off the stories of the intended building, and inclose the stair-case as shown by the drawings, with deal partitions two panels in height, composed of 2-in. deal with panels not more than 10 ins. wide of ¾-in. deal, and fixed with all requisite fittings complete.

ors, &c. 4074. To fit up the five external doorways with 2-in. four-panel bead-butt and square doors with 1½-in. panels; each door is to be hung with three 3½-in. wrought-iron butt-hinges, a pair of strong wrought-iron dogs with wrought-iron sockets, and a very strong 8-in. draw-back iron rimmed lock with strong plain brass furniture in a fir proper door-case 5 ins. by 4 ins., with oak framed and weathered sill 4 ins. by 3 ins.; to put to each doorway an inch yellow deal riser; and to put to each of the two outer doors of the stair-case two 10-in. bright barrel-bolts.

4075. To put over three of the external doors beaded transoms and 1½-in. fan-lights, with a wrought-iron bar ¾-in. square opposite each sash-style and muntin.

4076. To put to the doorway of the counting-house, a 2-in. four-panel square-framed door with inch deal panels, and hung with a pair of 3½-in. wrought-iron butt-hinges and a best iron-rimmed 7-in. lock with plain brass furniture and strong beaded stops.

all-linings. 4077. To line the whole of the brick-work of the counting-house with ¾-in. white deal planks, wrought, matched, and beaded, and strongly fixed with the requisite backings and furrings.

air-case. 4078. To construct the stair-case leading from the basement to the ground-story according to the drawings, with inch rough deal risers, 1½-in. rough deal treads and landing feather-tongued: the treads landings and risers jack-planed all over on the under side, and housed into 2-in. deal string-boards.

4079. To cover over the stair-case with a raking soffit to correspond with the partitioning inclosing the stair-case.

ep-ladders. 4080. To provide and fix in the situations shown by the plans, step-ladders with 1½-in. deal wrought and framed sides, and 1¼-in wrought and framed steps; and to provide also a light step-ladder to ascend to the dormer.

lvy-fittings. 4081. To fit up the intended men's privy, with a square framed front and door with a pair of 3-in. butt-hinges, a Norfolk thumb-latch, and a small bolt, 1½-in. seat and riser with all proper bearers and other fittings, and a turned lid.

cubic feet extra -timber. (See § 1071.)

stern and water-itt. 4082. To take down carefully the cistern at present over the water-closet, repair thoroughly the wood-work thereof, and refix the same with all proper bearers and fittings in the lower part of the stair-case of the dwelling-house.

4083. To provide and fix in the with proper

bearers complete a sound and perfect wine-pipe well pitched on the inside thereof to serve as a water-butt.

SMITH.

Window-bars and chimney-bars.

4084. To put over the head of each of the ten windows of the ground-story, and of the one-pair story, a wrought-iron bar, 2 ins. by ¾ in., and 5 ft. 6 ins. long.

To put over each of the fire-places, a chimney-bar 2½ ins. by ½ in., properly corked at the ends thereof.

Front gate and iron railing.

4085. To take down from the intended gateway, a portion of the iron palisading next street, to alter, repair, refix, and make complete the same, in order to form an inclosure-railing for the large landing leading up to the entrance on the ground-story of the intended building; to provide and fix new iron palisading (to correspond with the old palisading last mentioned) sufficient to complete the inclosure last mentioned; to alter, refix, and make complete, the portions of the old palisading adjoining to the intended gateway; to put strong wrought-iron standards thereto securely braced, and to provide and fix in the intended opening a gate to correspond with the old palisading, with wrought-iron frame, four wrought-iron horizontal rails, a wrought-iron brace, proper mountings, a bell-metal socket, a best copper-warded lock with two keys, and all other proper appertenances complete.

Iron ties, &c. (Sec § 1703.)

4086. To provide 112 lbs. avoirdupoise of wrought-iron, in such ties, straps, screw-bolts, and other light wrought and hammered-work as the Surveyor may direct.

PLASTERER.

Ceiling.

4087. To put to the counting-house, a lathed plastered set and whited ceiling.

Lime-whiting.

4088. To lime-whiten twice the whole of the internal brick-work of the intended building, and the wall of the front area adjoining thereto.

Parker's cement.

4089. To execute in the very best Parker's cement stucco according to the drawings, the moulding under the copings of the parapet and of the gable of the building, the moulded capitals of the large brick pilasters, the heads of the ten windows of the ground-story and one-pair story, and the moulding under the stone string or sill below the level of the ground-story windows; the whole of the Parker's cement stucco is to be roughly coloured immediately that any portion thereof is done, and is to be finally jointed, and tainted in imitation of stone, with weather-proof outside colouring, with sufficient beer-grounds, Russia tallow, tar, and other proper ingredients therein.

IAPTER XLI.

PLUMBER.

. gutter, &c. 4090. To lay the front-gutter, and the back chimney-gutter of the building with 6 lb. milled-lead, turned up 5 ins. high next the brick-work, and 10 ins. high next the rafters.

To line the cess-pool with similar lead, and to solder thereinto a piece of 3-in. socket-pipe, and to put thereto also a 2-in. discharging-pipe.

. ridges. 4091. To cover the ridges with 4 lb. milled-lead, 16 ins. wide, properly dressed and secured.

mer. 4092. To lay round the head and sides and at the foot of the dormer, 6 lb. milled-lead flashings, 15 ins. average width.

es'-gutter. 4093. To put to the back eaves, and round the back chimney-stack, 4 in. cast-iron eaves'-guttering, securely fixed on strong-wrought-iron brackets, and put together with white lead.

W. P. 4094. To put to the front of the building a stack of 3 in. cast-iron rain-water-pipe fixed with head and shoe complete, and to put to the back of the building a stack of 3 in. rain-water-pipe of 6 lb. milled-lead fixed with proper shoe and with a cast-iron head.

ste-pipes, &c. 4095. To put to each of the intended sinks a strong 2 in. waste-pipe and a large brass bell grate: the upper waste-pipe is to be carried into the back rain-water-pipe.

To lay on the water with sufficient very strong lead $\frac{3}{4}$ in. pipe, and with ball-cocks and all other proper appertenances to the cistern when moved into the basement stair-case, and to the water-butt in the ; to put to the water-butt a lead $\frac{3}{4}$ in. strong pipe and a brass cock in order to draw water therefrom; and to put to the cistern a similar lead pipe with a similar cock in order to serve the water-closet.

PAINTER.

aration. 4096. To knot effectually, stop, pumice smooth in every part, and prepare properly in the most perfect manner, all the wood-work and other work intended to be painted.

ors, &c. 4097. To paint four times with the best oil-colour all the internal and external wood-works, iron-works, and other works of the intended buildings, and of the fittings and appertenances thereof.

r times in oil. 4098. All the sashes are to be finished externally with dark purple-brown, all the other painting is to be finished with such teints of stone-colour, drab, or other plain colours as may be directed.

GLAZIER.

Third glass.

4099. To glaze the whole of the sashes, windows, and lights of the intended new building, with good third Newcastle crown-glass, properly bedded, bradded, and back-puttied, and to clean and leave perfect the whole of the glazing, at the final rendering up of the works and premises as complete.

CHAPTER XLII.

SPECIFICATION *for works to be done in the erection of a* **PRINTING-OFFICE, STEAM-ENGINE-HOUSE, MACHINE-PRESS-ROOM, STEREOTYPE-PLATE-ROOM, COACH-HOUSE, CART-LODGE, STABLE, AND OTHER OFFICES** *for on a certain plot of ground at according to the Drawings hereunder enumerated.*

(If the establishment be not intended to have all the offices above mentioned, omissions from the description can be made accordingly.)

(Insert here a list of the Working-drawings. See § 986. *)*

BRICKLAYER.

Clearing of the site.

4100. *(If the site have to be cleared, insert a clause accordingly, for which see* § 3739. *)*

Old bricks.

4101. *(If any old bricks are to be used in the new buildings, insert a clause accordingly, for which see* §§ 1228, 3740, and 3990. *)*

District-surveyor, &c.

4102. To give to the District-surveyor the requisite notices, to obtain from the Surveyors of Pavements and Sewers and from the other public officers concerned in the execution of the works, the requisite licenses; and to pay all proper official fees and charges attendant upon giving such notices and obtaining such licenses.

Excavation, rubbish, &c.

4103. (Insert clauses for the ground-work and removal of rubbish according to the nature of the building. See Index.)

General brick-work.

4104. To execute all brick-work which may be requisite for the complete erection of the intended new buildings, and for adapting and completing the intended new buildings to and with all the adjoining buildings.

Fire-places, &c.

(See § 996 and Index.)

CHAPTER XLII.

Steam-engine chimney. *(The flue must be larger in proportion to the power of the steam-engine.)*

4105. To construct according to the drawings, the intended chimney for a steam-engine, the flue thereof to commence 14 ins. square, and to diminish upwardly to 9 ins. square; the whole chimney is to have full 9 ins. of solid brick-work on every side thereof, and is to be pargeted well on the inside; 15 ft. in length of the lower part of the flue is to be lined with fire bricks set in Stourbridge clay; the external shaft is to be carried up with two pieces of strong wrought-iron vat-hooping in every course thereof, and is to have the upper five feet in height of the brick-work of it set entirely in Parker's cement and clean Thames sand mixed together in equal measures.

Uncut arches.

4106. To turn arches and counter-arches as shown by the drawings, and wherever else may be requisite; all the external arches are to be tuck-pointed.

Gauged arches *(if any).*

(See §§ 992, 3839, and Index.)

Facings *(if any).*

(See §§ 358, 994, and Index.)

Drainage.

(See Index.)

Brick-on-edge and tile-creatings *(if any).*

(See § 998.)

Cutting, &c.

4107. To cut and rub in the most careful manner all the requisite splays and birds' mouths, and the rebates for such of the doorways as are not intended to have door-cases or linings of wood.

Paving.

(See § 1246, and Index.)

Plain-tiling *(if any).*

(See § 2167, and Index.)

Pan-tiling *(if any).*

(See Index.)

rods extra brick-work.

(See § 1007.)

Bricks.

(See § 1008.)

'4108. *Malm paving-bricks are to be recommended for the whole of the brick-work as the most excellent material; and besides being so hard as scarcely to decay within any assignable time, they are of so fine a colour as to make handsome work without any other facing-bricks.*

Mortar.

(See § 1009.)

Mode of doing the work.

(See § 1010.)

Lime-whiting.

4109. To lime-whiten twice the whole of the internal brick-work, and the soffits and the joists rafters and other timbers of the floors and roofings.

Jobbing-work.

(See § 1011.)

MASON. (See §§ 295—298.)

(See §§ 2914 and 4179.)

4110. To put all along under the window-fronts of the buildings a complete course of Aberdeen granite parallel square curb 12 ins. by 6 ins. in as few pieces as possible, and none less than 3 ft. in length, fairly and closely jointed, and with a copper plug weight 6 oz. run with lead in each joint; and to cut mortise-holes therein to receive the stubs of the cast-iron bases to the posts.

4111. To put to all the windows, Portland stone weathered sunk and throated sills 8½ ins. by 3 ins. The sills to the continuous windows are to have proper rising water-joints, and are to have in the joints lead plugs and channels run with lead.

4112. To cover the parapets of and the with Portland stone feather-edged coping 13 ins. wide, 3½ ins. thick in front, 2½ ins. thick at the back, throated at both edges, channelled and run with lead, and plugged with lead at all the joints therein, and with proper mitred quoin-stones worked out of the solid.

4113. To put to each of the door-ways of three blocks of Yorkshire stone, each 8½ ins. high, 1 ft. 6 ins. long, and as wide as the thickness of the wall, fairly and properly tooled, and rebated out to receive the door; and to let thereinto and run with lead the hooks of the hinges and the box-socket of the lock.

4114. *Pieces of granite square street curb will cost no more than Yorkshire stone except for the extra labour of cutting the rebates and holes therein, and will be heavier and more durable and will therefore be preferred.*

The ordinary charge for square granite curb 12 *ins. by* 8 *ins. with the plain work upon it as brought to London, and fixed, is generally under* 3*s. per cubic foot.*

4115. *Door-cases and door-linings of wood should be in all buildings avoided as much as possible, more particularly in printing-offices and other buildings much subject to conflagration, and in which elegance is not required though much valuable property is deposited in them.*

stair-case of 4 ft. rise.

4116. To construct the stair-case according to the drawings, with steps entirely of solid quarry Yorkshire stone steps, back-jointed and pinned into the brick-work 9 ins. at the least, and with landings of Yorkshire stone 4 ins. thick tailed into the brick-work all round the same 4 ins. at the least, and with proper risers.

To put to the whole of the stair-case and to the landings thereof, balusters of wrought-iron one inch square, with wrought-iron rounded top-rail 2 ins. by ½ in., with scroll at bottom, and with the bars riveted at top into the rail and run with lead at bottom into the stone steps.

4117. *The stair-case of a printing-office ought always to*

be of stone, with no wood-work whatever attached to it, and it may be roofed over with slabs of stone without any timber supports; and it would be well if all the doors communicating with the stair-case were of wrought-iron, so as that in the event of fire the flames might be shut out from the stair-case, so as to leave free access for ascending to any part of the building, and thus insure the removal of property without danger: if iron doors be considered too heavy for general use, there may be also light wooden inner doors, which, however, could be lifted off their hinges immediately on the alarm of fire.

4118. *A great source of the very frequent disastrous fires to the buildings of printing-offices, is the hanging to dry all over such buildings beneath their wooden floors, the sheets of paper as soon as printed; this occasions the almost instant total destruction of printing-offices: it would be well, in order to prevent the ruin, the destruction of valuable manuscripts, and the loss of life resulting from this, if an Act of Parliament forbade the hanging of "poling" and paper in this situation: all the drying ought to be performed in a detached incombustible apartment, in which many tiers of paper might be hung above each other, and the whole could be heated by flues running round in the thickness of the walls, or better still by hot-water apparatus: to the interior of such an apartment neither fire nor candle should ever be allowed to enter; and even though the paper within it should be burnt, still all the type, forms, cases, presses, and manuscripts, in the establishment, would remain uninjured.*

himney-pieces, c. *(if any.)*

4119. To put to the chimneys of the jambs mantles and shelves of 2-in. Portland stone 7 ins. wide; and to put to each fire-place a back hearth and a slab both of Yorkshire stone full 2¼ ins. thick, and the slab 2 feet wide and 18 ins. longer than the width of the chimney-opening.

inks.

4120. To provide and fix on each story a sink of the size shown by the drawings, each of Yorkshire stone 7 ins. thick, cut out to receive the grating, and fixed with all requisite bearers complete.

4121. *Printing-offices, all manufactories, and indeed buildings of every description, should be furnished with at least one sink on every story: the trifling extra expense to which this would lead, would be very soon repaid by the saving of labour in the carriage of water, while cleanliness would be greatly promoted; on this subject see the Specification for a work-house* (§§ 3661, 3663, and 3729). *Some employers, in order to promote industry in their dependents, will not lessen the labour in any department; but this principle causes in the end an extra expense to themselves, since the denial of but a few of such facilities occasions the employment of an extra attendant.*

4122. *The sinks in which printers' forms are washed, are usually lined with lead, and there is usually a large platform or shallow sink lined also with lead, laid below the other sink, in order to receive the large quantity of splashing and the*

overflow of water which falls from the upper sink; the lower sink if lined with lead, should have a matting of wood laid over it, in order to protect the lead-work from the treading of the feet of the workmen. A printer's washing-sink should if possible be set in the lowest story of the building, that no wood-work may be rotted by the large quantity of dampness which always attends it, and that there may be no escape of water to any stories below it.

Bases to the heel-posts of the stables.

4123. To put to each of the heel-posts of the stall-boards in the stable, a base of granite 1 foot cube, set flush with the paving.

Yorkshire stone-paving.

4124. To pave the machine-room, and the whole of the basement-story, with Yorkshire stone full 2½ ins. thick, with the edges of the stone fairly tooled all the way through the whole thickness of the same, and laid in and jointed with Parker's cement upon cross-walls.

Granite paving.

4125. To pave the stable and the court-yard with the best Aberdeen granite full 6 ins. deep, and sorted of uniform width about 4 ins. at the top and 3½ ins. at the bottom; the whole of the paving is to be laid close stone to stone, upon full 3 ins. in depth of rough ballast, and is to be completely grouted all over and between the joints with the best stone-lime mortar.

Public paving.

4126. To remunerate the commissioners (or other competent proper authorities) for making good the public paving.

SLATER. (See §§ 542—3.)

Dutchess slating. (See § 1683.)

Countess slating. (See § 1023.)

Bond-nails, &c. (See § 1024.)

Pointing. (See §§ 1023 and 3904.)

Reparation of damage, &c. (See § 1025.)

CARPENTER and JOINER. (See §§ 337—40.)

New materials. (See § 1029.)

Timber and deals. (See § 1031.)

Sundries. (See § 1032—3.)

Bond-timber and wood-bricks. *(It would be well if iron bond were wholly substituted for wooden bond. See* § 1038.)

4127. To put to each story all round in the internal brick-work of the and the two complete tiers of fir bond-timber scantling 4 ins. by 2½ ins. in pieces as long as possible; and to put in the brick-work such wood-bricks as may be requisite for fixing the various finishings and other works.

(See § 1041.)

4128. As few lintels as possible should be used, especially in a printing-office.

ng. 4129. To provide, fix, ease when so directed by the surveyor, and finally remove, all centering and turning-pieces requisite for turning the vaulting *(if any)* and the arches and trimmers of every kind.

	Ins.	Ins.
breast-rs, and r-heads. 4130. Wrought and framed posts in the ground-story cut away below the windows so as not to appear in the face of the brick-work	12 by	6
A cast-iron socket-base to each post weight 28 lbs. with two stubs cast on the bottom thereof to be let into the granite base. (See § 1282.)		
A plate of 5 lb. milled-lead wrapped round the head of each post.		
Wrought and framed breast-summers	12 —	12
Wrought and framed window-heads above the ground-story	9 —	9
Moulding at the head of ditto to support the brick-work.		
Wrought and framed window-posts to the one-pair story	9 —	6
Do. ... ... two-pair story	9 —	5
Do. ... ... three-pair story	9 —	4
Diagonal struts or braces to prevent the lower posts racking from the perpendicular	6 —	5
Do. ... ... to the window-posts of the one-pair story	5 —	5
Do. ... ... two-pair story	4 —	5
Do.... ... ... three-pair story	3½ —	5

4131. *In buildings of this description there will frequently appear in the brick-work above the ends of the timber breast-summers and window-heads, a crack at each end of each long series of windows; if the building be carelessly built, this will be considerable, and in instances where much pains have been taken by the author both as to the foundation and the careful bonding and bracing together of the work, settlement of this description has shown itself in a year or two after the completion of the structure; but this on being judiciously stopped has never reappeared: sometimes it has been a mere indication of settlement, without measurable extent; this defect is caused by the shrinkage and subsidence of the timber, and cannot be caused by the side brick-work of the building subsiding by the shrinkage of the mortar-joints more than the story-posts, for these cracks invariably rake or incline in a direction contrary to that in which they would incline were they caused by the shrinkage of the mortar; in order to counteract the ultimate permanent injury and ruinous appearance which the drooping of the window-heads would cause to the building, care must be taken that all the window-fronts shall not, when first built, be level, but rising in the middle, this convex irregularity increasing upwardly in each story ¼ in. (or even more in*

large buildings) : by this precaution such buildings will be found a few years after they are built to appear level, whereas from a want of this precaution they would at the same time have appeared falling down, but the absolute cause of fracture in the brick-work is the shrinkage of the timber, for a minute account of which see § 565.

It is of the utmost importance for buildings of this description that the window-posts be framed from top to bottom of the whole building, each post reaching from the window-head below to the window-head above, otherwise the fronts will (to use the vulgar technical expression) buckle at the feet of the windows and become ruinous. The brick-work must be filled in between the window-posts and full 4 ins. thick before the outsides of the posts, the posts and breast-summers may indeed on the ground-story be brought out to the outer face of the brick-work, but the London "Building-act" by section 46 compels them to be recessed 4 ins. deep in every story above the ground-story: in following this careful practice the author has to the best of his ability endeavoured to fulfil the directions of the Building-act, though even this method was disputed by a District-surveyor on the ground that the Act does not allow timber breast-summers or window-heads above the ground-story; on that occasion one of the magistrates before whom the case came was of opinion that the act not only allows breast-summers above the ground-story, but points out in what manner they are to be placed, viz. to be recessed within the brick-work 4 ins., and after a personal view of the premises by two magistrates the case was dismissed; and that this interpretation of the Act is strict, is shown by the existence of a very large number of buildings constructed in this manner by and under the immediate direction of District-surveyors themselves. The mouldings which are usually put above the window-heads to prevent the brick-work from giving way or tipping over is not in strictness according with the Building-act which requires all wood-work above the ground-story to be recessed 4 ins.; in compliance with this requisition the author first in the year 1822 used mouldings of cast-iron, and this method he has observed to be pursued since by others.

There can be no doubt that it would be highly beneficial to render printing-offices wholly fire-proof, but this would lead to very considerable extra expense.

(See § 1284.)

4132. To *boat-bridge* each end of the several breast-summers and window-heads by three pieces of wrought-iron each 1½-in. by ½ in. and 3 ft. long, the lower bridgings being set ¼ in. out of level, the second bridgings ½ in. out of level, and the third bridgings ¾ in. out of level (*or more or less according to the greater or less dimensions of each particular piece of timber and of its state of seasoning.*)

(A piece of iron or of stone should be set in the brick-work of each pier, under the ends of the iron bars.)

Printing-office floors.

	Ins.	Ins.
4133. Wall-plates	6	by 6
Girders		

	Ins.	Ins.
Joists		
Trimmers and trimming-joists		
1½ in. yellow deal flooring-boards listed free from sap-wood		

4134. *The scantlings of the girders, &c., will depend upon their bearings: if the building be only* 18 *or* 20 *ft. wide, girders will be much better omitted, and the building will be much more effectively tied together at every foot by joists; if the width of the building do not exceed* 25 *or* 30 *ft., the joists may be bridged transversely upon girders, without resting upon internal story-posts, which are to be avoided as much as possible, as the irregular settlement caused by heavy floors resting in part upon external supports, and in part upon internal posts, has been the cause of great inconvenience and expense: the author has seen the ends of the girders of a stack of floors carried down by the walls, which were built very hastily upon a bad foundation, till the girders were strained and bent* 6 *ins. out of level, so that the story-posts acted upon by the prodigious force of the girders powdered to shivers, the weak piers upon which they were built, and the floors were thus relieved from their excessive unnatural flexure, by the giving way of all beneath them: after this the piers were renewed in brick-work set in Parker's cement, with extended bases, and having pieces of iron-hooping laid in their courses, but from the softness of the ground the same effect occurred again almost immediately to the floors, though in a less degree.*

4135. *If internal story-posts or iron-columns be adopted, the joists should extend in one length from the back to the front of the building, so as to tie in the external walls, and the joists should be bridged above the girders laid upon the heads of the columns or story-posts.*

4136. *If girders be used without story-posts, after the quantity of timber to be used in them be determined upon, the most advantageous disposition of that quantity, will be found to be to divide it so that there may be a girder to every window-post; thus will be avoided the throwing of straining-weights upon the window-heads, off the points of support; much less weight will be concentrated on one point, and by the short distance which the girders will be apart from each other, half the quantity of timber in joists, or less, will be equally strong, the girders will thus have less burden to carry, considerable cost will be spared, and there will be less material either to rot or to burn.*

4137. *As by the present method of conducting the business of many printing-offices, the imprinting is performed by a machine fixed upon a paved floor on the ground-story, the upper floors of the building are no longer subject to that heavy shaking to which all upper floors supporting the ordinary presses are subject; in order, therefore, to render such buildings fire-proof, the floors may be made wholly of incombustible materials, as are those to the new warehouses at Sheerness and other places; this can be easily effected by a series of girders, and iron columns*

with cross-binders also of iron, upon which can be laid Yorkshire paving-stone to form the flooring; and even ner stone may be made to answer with more certainty, and of the iron binders may be omitted by turning arches of b work from binder to binder under the pavings.

Hay-loft flooring.

4138. Wall-plates ... ... 5 by
Joists ... ...
Trimmers and trimming-joists ... ...
1¼-in. yellow deal flooring-boards listed free from sap-wood rebated and filleted on the under-side.

Roof over the

4139. Wall-plates ... ... 6 —
No. tie-beams ... ...
principals ... ...
queen-posts ... ...
collar-beams ... ...
straining-sills ... ...
struts ... ...
angle-ties each 6 ft. long ... ...
dragon-pieces ... ...
Pole-plate ... ...
Blocks beneath ditto ... ...
Hips and ridges rounded for lead ... ...
Purlins ... ...
Rafters ... ...
Plates at the head of the rafters ... ...
Joists for the flats ... ... scantling in the centre ... ...
Do. scantling at the ends so as to afford a current ...
1¼-in. yellow deal boarding for lead.
1-in. deal slate-battens 2¾ ins. wide.
1¼-in. yellow deal gutter-boards on strong bearers 10 ins. wide in their narrowest parts, with 2½-in. drips, and with current 1½ in. to every 10 ft. run.
All the timbers of the roof are to be wrought smooth.

Dormer.

(See Index.)

Quartered-partitions *(if any)*.

(See Index.)

Framed deal partitions *(if any)*.

(See Index.)

4140. The use of wood partitions should be discountenan as much as possible in printing-offices. (See Index.)

Doors. (In order to reduce the quantity of combustible materials, the panels of the doors may be of wrought-iron.)

4141. To fit up the printing-office with 2-in. four-panel square framed internal doors with panel inch deal hung with very strong hook-and-eye wrought-i hinges, and very strong 8-in. iron-rimmed locks with strong b furniture.

To fit up the external door-ways of the printing-office with 2-in. deal bead-flush and sq four-panel doors, hung with very strong hook-and-eye wrou iron hinges, and each with two very strong 12-in. barrel-bolts

a 12-in. very strong iron-rimmed draw-back lock with plain brass furniture and two keys.

Door-cases.

4142. To put to the doors fir proper door-cases scantling 5 ins. by 5 ins. tenoned at bottom into the stone steps (or sills) and with a piece of 4-lb. milled-lead 15 ins. square wrapped all round the bottom of each post, dressed up and secured at the top by copper nails.

Door-linings.

4143. To put to the doors of wrought framed tongued and beaded linings of inch deal.

Door-cases and door-linings of wood in a printing-office should be as much discountenanced as possible. (*See observations*, § 3693.)

Stair-case (if of wood.)

4144. To construct the stair-case according to the drawings wrought all over, with treads and landings of 2-in. oak and 1½-in. yellow deal risers, housed into 2½-in. deal, string-boards and wall-strings, framed and chamfered newels 4 ins. by 4 ins., framed and rounded hand-rails 4 ins. by 3½ ins., diagonal-braces 2½ ins. square instead of balusters, 1¼-in. deal-apron linings, and all other proper fittings and appertenances.

The use of wooden stairs should be discountenanced in every kind of buildings, more particularly in printing-offices and other buildings subject to be burnt. (*See* §§ 2550—1.)

Skirtings.

4145. To skirt the with inch yellow deal 6 ins. high plugged to the walls.

The press-rooms and composing-rooms and all the unplastered apartments scarcely need skirtings, and all the plastered rooms, &c. on the ground-story and basement-story may with propriety have skirtings of Parker's cement, which will neither rot nor burn. Instead of skirtings, strips of deal 2 ins. wide, chamfered, and scribed to the walls, may be used.

Stalls, &c.

4146. To divide the stables by stall-partitions of 1½-in. yellow deal, wrought ploughed cross-tongued and beaded, with wrought and grooved bottom rails of 8-in. oak 10 ins. high, and oak grooved and rounded top-rails (*ramped if so desired*) of oak 3½-ins. by 4 ins.; to put on each side of each stall-board an 1¼-in. rounded middle-batten; and to put to each stall-partition a heel-post of oak 6 ins. diameter at bottom, and 5 ins. diameter at top, with a moulded capital and a large socket-base of cast-iron extending 9 ins. up the foot of the post. (See § 4201.)

4147. *Heel-posts may be well made of cast-iron, for which see* § 3949; *also, as a projecting base is apt to wound the feet of the horses, an iron socket-base to a wooden post may be made without any projection, and with a plate cast to the bottom of it, with a rim to extend down over the head of the pier upon which it is to stand.* (*See* § 1282.)

Mangers, racks, &c.

4148. To fit up the stable, with mangers of cast-iron with strong front rims or rails also of cast-iron, and securely fixed by sufficient bearers; to put to each stall a large wrought-iron rack, securely fixed, and to put to the whole of the stable the requisite manger-rings.

Stable ventilation. (See Index.)

Stable-gratings. 4149. To put in the floor of each stall a large grating of cast-iron *(or of copper)* in a rebated frame of cast-iron. (See Index.)

Privies. 4150. To fit up the privies with wall-plates 4 ins. by 2½ ins., wrought rafters 3½ ins. by 2 ins., slate-boarding wrought on the under-side, inch yellow deal grooved cross-tongued beaded and ledged doors hung each with a pair of 20-in. cross-garnet hinges, and a small bolt; and to fit up the inside of each privy with a seat and a riser of 1¼-in. yellow deal grooved and cross-tongued and fixed upon all requisite bearers.

Every privy should be built with one or more ventilation flues extending from under the seat to above the roof.

Water-closets *(if any)*. (See Index.)

Extra fir timber. (See § 1071.)

Jobbing-work. (See § 1070.)

PLASTERER.

4151. *In general no plastering is required to a printing-office, as it becomes almost immediately damaged; but if any plastering be adopted for counting-houses or living-rooms attached to the establishment, clauses can be added accordingly. The mode of forming ceilings to printing-offices of boards is exceedingly reprehensible. It adds at once greatly to their cost and to their consumable nature.*

Ceilings *(if any)*. (See Index.)

Plastering to quartered-partitions *(if any)*. (See Index.)

Rendering. (See § 1074.)

Whiting. (See Index.)

Colouring (See Index.)

Internal stucco. (See §§ 1487 and 1622.)

External stucco. (See §§ 1845 and 2048.)

Pugging. (See Index.)

PLUMBER.

7 lb. milled-lead gutters and flats. (See 3725.)

4 lb. milled-lead flashings 5 ins. wide. (See 3514.)

[redacted]

APTER XLII.

milled-lead
ı. wide to
ınd ridges. (See § 3515.)

iron eaves'-
ring *(if any)*. (See § 3969.)

cast-iron
water pipes. (See § 2632.)

ditto. (See § 3504.)

ditto. (See § 3132.)

g, &c. to (See Index.)

e-pipe, &c. (See Index.)

rn. (See Index.)

r-closets *(if* (See Index.)

ıs to common
r-closets *(if* (See Index.)

PAINTER.

ıes to wood-
· 4152. To knot, stop, pumice smooth in every part, prepare properly, and paint four times with the best oil-colour, the whole of the wood-work of the sashes, window-frames, doors, door-frames, and of all the other internal and external works usually painted.

ıes to iron-
· 4153. To prepare properly and paint 5 times with the best oil-colour the whole of the iron-work of the buildings and of the appertenances thereof, the first two coats of colour being done with red-lead paint.

ırs, &c. (See § 1502.)

GLAZIER.

ıd Newcastle
· 4154. To glaze all the windows and lights with good second Newcastle crown-glass, properly bedded, bradded, and back-puttied; and to clean and leave perfect the whole of the glazing immediately prior to the rendering up of the whole of the works as complete.

CHAPTER XLIII.

SPECIFICATION OF WORKS *to be done for* *in the erection and entire completion fit for use and occupation of a* DWELLING-HOUSE, AND STABLING SHEDS AND OTHER OFFICES, *on a plot of ground called the* WHARF, *situate adjoining to the South side of the basin of the* *canal and for the performance of other works therewith connected.*

(Insert here list of Working-drawings. See § 986.)

BRICKLAYER.

Notice, &c. to District-surveyor. (See § 987.)

4155. To give to the District-surveyor the requisite notices for the erection of a second-rate building, and for one addition thereto, and for the erection of the stable-offices, and for the coal-shed ; and to pay to him his proper official fees.

Digging, &c.

4156. To excavate the ground for the cellar, the foundations, the drains, the floors, and all the other works which may so require. To render level and hard the bottoms of all the trenches, and to fill in and consolidate properly the ground about all the footings, drains, and other works. The ground is not to rise beneath the floors higher than shown by the sections; all the chalk and gravel of necessity removed by the execution of the intended works, is to be preserved and is to be laid down as far as the same will go towards making up the yard of the wharf; all the superfluous ground remaining from the excavation, and all the rubbish resulting from the execution of the intended works are to be deposited as shall be directed either on the premises of the wharf or on the new roadway adjoining thereto.

4157. *This particular work proved two things, proven often enough before, first, the mischief of the interference of incompetent persons, and secondly, the uncertainty of a foundation upon ground raised upon the original level of the earth. The site of these buildings had been raised by depositing thereon the earth excavated from the canal-basin : though this had lain* 15 *years to consolidate, yet the author desired to excavate quite through it, which would have occasioned an extra expense of about* £100 ; *by the fatal advice of a builder, this was refused ; the only precaution, and that was but grudgingly allowed, was the use of a course of Yorkshire stone under the footings, and bond of iron hooping round the walls : this prevented some mischief, still the brick-work settled mortifyingly in the principal front of the house ; after a time the author was allowed to place iron bars under the upper arches, and to stop the fractures in the lower arches : no further opening appeared in the parts of the building where the iron bars were placed, while fracture still continued in the lower arches. This was one of the only two cases in which the author ever had any work settle at the foundation, and he*

has resolved, under whatever advice, that this shall be the last, if solicitude and refusal to risk can insure the certainty of a foundation.

General brick-work. (See § 990—1.)

4158. To execute in the very best, most careful, and accurate manner, all brick-work which may be requisite for carrying into effect the buildings and their appertenances according to the drawings, and so as to render the whole of the buildings, works, and premises complete and finished in every respect.

Western-wall.

4159. The western wall of the stable-offices is to be raised upon the present wall; the part thereof which is not one brick and a half in thickness being first taken down, and the old bricks so taken down may be used as far as sound in the new work, being first properly cleaned; the present buttresses of the wall are to be cut away where occurring within the stable-building, leaving only such portions thereof as will be below the mangers and will not project before the same: the whole of the present Western-wall of the premises is where requisite to be repaired, pointed, and made good in a workmanlike manner; all the external pointing thereof being done with stone-lime blue mortar.

Gauged arches. (See §§ 570—594.)

4160. To put to the niches and openings in the Southern fronts of the stable-offices and dwelling-house the very best gauged arches and domed work, according to the drawings, accurately cut and set.

Uncut arches.

4161. To turn neat uncut arches over all the other internal and external openings throughout the buildings, and to tuck-point the same on the outsides thereof.

Cores.

4162. To form in rough brick-work such cores as may be requisite for receiving the Parker's cement work on the South end of the stable-buildings.

(The proprietor of this establishment only holds a lease of the ground for 60 years.)

Facings.

4163. To face the exposed brick-work of the Southern-fronts (with the reveals thereof) of the stable-offices and of the dwelling-house, with the very best hard second malm stock-bricks matched to a light uniform colour, and finished in the neatest possible manner in Flemish bond with flat joints.

Chimneys.

4164. To properly turn, parget, and core all the flues; to put to the kitchen fire-place a chimney-bar of wrought-iron 3½ ins. by ⅝ in., and to put to each of the other fire-places a chimney-bar of wrought-iron 2½ ins. by ½ in.; each chimney-bar is to be properly corked at the ends thereof.

4165. To put to each of the fire-places on the ground-story, a fender for the support of the chimney-slab, of 9-in. brickwork 15 ins. high; and to put to each of the other fire-places, a trimmer of 4-in. brick-work 12 ins. wider than the chimney-opening.

4166. To put over each of the flues a large Parker's cement chimney-pot of approved pattern.

(Chimney-pots of clay, burnt white or black, are to be preferred: these should be brought to London for general use.)

Tile-cresting, &c. in Parker's cement.

4167. To finish the western and the eastern walls of the premises, with Parker's cement and Thames sand mixed together in equal measures; and to finish the dwarf-walls of the offices and yards attached to the dwelling-house, with brick-on-edge set in Parker's cement and sand as last described.

Indents.

4168. To cut and parget in the old walls proper perpendicular indents, where requisite in order to receive the intended new brick-work.

Bedding, &c.

(See § 999.)

Cross walls, brick-piers, &c.

4169. To build for the support of the paving to the scullery sufficient cross-walls of 4-in. brick-work 9 ins. high.

4170. To build for the support of the sleepers of the ground-story sufficient piers of brick-work not more than 3 ft. apart, each consisting of one course of work 9 ins. square and two courses of work 9 ins. by 4 ins.

Brick-paving.

4171. To pave with hard stock-bricks, laid flat in mortar and grouted also between the joints with liquid mortar, the cellar-story of the dwelling-house.

Brick-nogging.

4172. To brick-nog the partition between the best parlour and the kitchen.

Dung-pit.

4173. To construct the dung-pit according to the drawings, and finish the breast-wall thereof with a strong cast-iron curb.

Copper.

4174. To provide and set in the scullery a strong brewing-copper 2 ft. 9 ins. diameter, with door furnace-bars and all other proper iron-work and appertenances complete.

Drains, &c. (See § 1104.)

4175. To construct a barrel-drain with the greatest possible current, 14 ins. bore, according to the plan, continued to join the public sewer, in 4-in. brick-work stuccoed over the lower half thereof ½-in. thick with pure Parker's cement; to put from each of the privies and rain-water-pipes a large funnel set in Parker's cement and stuccoed on the inside also with Parker's cement. To put to each of the drain-gratings a funnel as to the rain-water pipes, with a complete stench-trap to each thereof.

1 rod extra brick-work. (See § 1007.)

4176. To provide under the contract one rod reduced of the best stock brickwork, to be used in such extra works not intended to be done in the necessary work of the buildings as the surveyor may direct; the value of such of the said extra brick-work as may not be directed to be used, is however, to be deducted from the amount of the consideration of the contract after the rate of per rod reduced.

Bricks.

(See § 1008.)

Mortar.

(See § 1009.)

CHAPTER XLIII.

Mode of doing the work. (See § 1010.)

Lime-whiting, &c. 4177. All the interior work of the stable-buildings, lofts, cellar, scullery, and wharf-men's privy, is to be finished completely fairly, and is to be twice lime-whitened.

Scaffolding. (See §§ 1255, 2259, 3038, and 3080—84.)

Point with Parker's cement breast-wall of camp-sheding. 4178. To rake out as far as requisite and point with one half new quick Parker's cement and one half clean Thames sand the whole of the external brick-work of the breast-wall of the camp-sheding * of the wharf.

MASON. (See §§ 265—95.)

3-in. Yorkshire stone under foundations. 4179. To put under the foundations of the buildings a course of 3-in. Yorkshire stone paving of the several widths shown by the sections and the plan of the foundations, no stone of such paving to contain less than 5 ft. superficial. (Two courses of stone would be better; see § 2914.)

Curb to coal-shed. 4180. To put all along the breast-wall of the pit of the coal-shed, a granite parallel square curb 12 ins. by 9 ins., with fair heading-joints plugged with copper and run with lead, no stone thereof is to be less in length than 5 ft.; and to let into the same the bases of the iron columns.

3-in. Yorkshire stone for cornice. 4181. To provide and set in the brick-work of the south end of the stable-offices, sufficient 3-in. rough Yorkshire stone 18 ins. wide for forming the cornice and pediment thereon.

2½-in. Yorkshire paving. 4182. To pave with 2½-in. Yorkshire stone laid in regular courses on cross-walls, and with the edges thereof wrought fairly through the whole thickness of the stone, the whole of the scullery and the two small yards attached to the dwelling-house.

Copings. 4183. To cover the front parapet of the dwelling-house, and the South fence-walling, with Portland-stone coping 4 ins. thick in front, 2½ ins. thick at the back, 13 ins. wide, with solid quoin-stones, throated on the inside, and plugged with lead at all the joints thereof.

Window-sills. 4184. To put to all the front windows of the dwelling-house, weathered and throated sills of Portland stone 9 ins. by 5 ins.

To put to all the remainder of the windows throughout the premises, sills of 3-in. Yorkshire stone, throated, wrought with fair-edges in front, and laid sloping. (See § 1014.)

Steps, &c. 4185. To put to the front entrance, steps of the best hard solid Portland stone, according to the drawings.

4186. To construct the steps leading down to the cellar-story, of the dwelling-house, and the external steps leading up

* The orthography of this word appears to be uncertain; it is written and pronounced by different persons *camp-sheding*, *camp-sheeting*, *camp-shed*, *camp-shoot*, *cămn-shŭt*, &c. &c.

to the one-pair story of the stable-offices, according to the drawings, of 3-in. Yorkshire stone, wrought with fair edges in front.

4187. To put to the door-way of the stable, a sill of granite 10 ins. by 7 ins., mortised out to receive the ends of the door-case.

4188. To put to the doors of the privies, and to the remainder of the external door-ways of the premises, steps of solid Yorkshire stone, properly back-jointed, and cut out to receive the ends of the door-cases.

4189. To put to the steps leading up to the one-pair story of the stable-offices, wrought-iron balusters $\frac{3}{4}$ in. square, after the rate of two balusters to each step, with wrought-iron rounded top-rail 2 ins. by $\frac{3}{4}$ in.

Marble chimney-pieces.

4190. To put in the principal room on the ground-story, a marble chimney-piece, with a slab value together six guineas exclusive of the fixing thereof.

To put in the south-west parlour and to the room over the kitchen, marble chimney-pieces, with slabs value altogether the sum of eight guineas exclusive of the fixing thereof.

Portland stone chimney-pieces.

4191. To put to the fire-place of the kitchen 2-in. Portland stone jambs and mantle 10 ins. wide.

To put to all the remainder of the fire-places $1\frac{1}{2}$-in. Portland stone jambs mantles and shelves each $5\frac{1}{2}$ ins. wide, and 2-in. Portland stone slabs 18 ins. wide and 11 ins. longer than the width of the chimney-opening.

Yorkshire stone hearths, &c.

4192. To put to each fire-place, a back hearth of $2\frac{1}{2}$-in. Yorkshire stone, and to put to the kitchen fire-place a foot-pace of $2\frac{1}{2}$-in. rubbed Yorkshire stone.

Sinks.

4193. To put in the scullery a Yorkshire stone sink 3 ft. 6 ins. long and 2 ft. 6 ins. wide, securely fixed with all requisite bearers.

To provide and fix where directed two five-hole sink stones, each sunk out of a piece of 4-in. Yorkshire stone 16 ins. square.

Stable paving.

4194. To make up and consolidate the ground and pave with good 7-in. pebbles selected uniform in size, the whole of the stable-building ; all the paving is to be laid and well fitted together close stone to stone, on full 2 ins. in depth of coarse ballast ; and is to have sufficient fine screened gravel laid over the same, to work into the paving ; and the paving is also to be rammed a sufficient number of times, and is to be left solid and with proper currents.

SLATER. (See §§ 542—3.)

Countess slating.

4195. To slate the whole of the sloping roofs of the buildings with the very best strong countess slates pointed on the inside thereof with stone-lime mortar with sufficient hair therein.

Nails, bond, &c. (See § 1024.)

Reparation. (See § 1025.)

[redacted]

IAPTER XLIII.

CARPENTER and JOINER. (See §§ 337—40.)

materials, (See § 1029.)

ber and deal. (See §§ 1031—2.)

The quarters intended to be brick-nogged are to be 13¾-ins. apart and no more.

lries. 4196. To provide and fix all requisite shores, struts, puncheons, oak wedges, ties, cletes, beads, stops, fillets, tilting-fillets, backings, blocks, linings, casings, furrings, and rolls; to provide all requisite moulds rods and patterns for setting out and executing accurately all the various works; to provide and fix 336 lbs. avoirdupoise of wrought-iron in such straps, ties, screw-bolts, and other work as the surveyor may direct; and to perform such rebating, grooving and tonguing, beading, scribing, chamfering, housing, jointing, mortising, framing, dove-tailing, planing, and other work and labour as may be found requisite for the perfect performance of and the thorough completion of the whole of the buildings and the fittings and appertenances thereof.

ering. 4197. To provide, fix, ease when so directed, and finally remove, all centering and turning-pieces requisite for the trimmers and arches of every kind.

l-timber and l-bricks. 4198. To put in the brick-work the following fir bond-timber scantling 4 ins. by 2½-ins. properly lapped and spiked together in lengths as great as possible.

All round the stable, two tiers.

All round the story over the stable, one tier.

All round each story of the dwelling-house and round the counting-house, two tiers.

Along the eastern and southern walls of the coal-shed and round the privies and harness-room, one tier.

To put in the brick-work all wood-bricks requisite for fixing the skirtings of the ground-story and to receive the other finishings and works so requiring.

els (see 1). 4199. To put such lintels and filling-in-lintels as may be requisite in order to carry the brick-work over the openings; each lintel is to be 5 ins. high, 18 ins. longer than the opening and of the width of the brick-work.

	Ins.	Ins.
nd-floors. 4200. Joists to the entrance-hall and the stair-case	5	by 2½
Trimmers and trimming-joists to ditto	5	— 2¾
Oak plates to ditto	4	— 2½
Joists to the remainder of the story	4	— 2¼
Oak sleepers to ditto not more than 4 ft. apart ...	4	— 3
Inch yellow deal straight-joint floor listed free from sap-wood		
pair floors to welling-e. 4201. Wall-plates and templets	4	— 4
Joists	10	— 2½
Trimmers and trimming-joists to ditto	10	— 3
Inch white deal straight-joint floor to the whole of the story.		

		Ins.
One-pair floors to the Stable-offices.	4202. Wall-plates	4
	6 binders	12
	6 oak turned columns under ditto 6 ins. diameter at bottom, 5 ins. diameter at top, grooved to receive the stall-boards, with moulded capitals, and with socket-bases of cast-iron according to the drawings.	
(See § 1282.)		
	Joists notched and housed above the binders	6
	Boarded-flooring formed of the boards of the new hoarding at present round the premises of the wharf, made complete with sufficient additional new deal to correspond therewith, should there be any deficiency in the quantity thereof; the flooring of the two living-rooms is to be planed on the upper side thereof.	
Roof over the coal-shed.	4203. Plate in the Eastern and Southern walls ...	4
	Lower plate above the iron columns on the Western and Southern sides	6
	Upper ditto to ditto	8
	8 struts between ditto	3
	3 framed puncheons to ditto	4
	5 tie-beams	10
	4 angle-ties each 4 ft. long	5
	4 dragon pieces to ditto	3
	Rafters	5
	Ridge and hips	8
	Slate-battens	¾
	3 cast-iron columns 5 ins. diameter at bottom and 4 ins. diameter at top, with caps and bases according to the drawings.	
Roof over the stable-offices.	4204. Wall-plate	4
	6 tie-beams	10
	4 angle-ties each 5 ft. long	4
	Rafters	5
	Ridge	8
	Slate-battens	¾
	Ceiling-joists to the two living-rooms	3
Principal roof over the dwelling-house.	4205. Wall-plates	4
	3 tie-beams running the whole length of the house from East to West	9
	8 angle-ties each 4 ft. long	4
	8 dragon-pieces to ditto	4
	Rafters	4
	Ridge and hips	8
	2 valley-pieces	6
	Slate-battens	¾
	Ceiling-joists spiked under the tie-beams	3
	Joists to flat over the stair-case	6
	Inch yellow deal boarding to ditto with furrings and with rolls not more than 2 ft. 3 ins. apart.	
	Tie to the truss over the lobby on the one-pair story of the dwelling-house	4
	King-posts and struts to ditto	4

[redacted]

APTER XLIII.

Ins. Ins.

Dormer, with frame-work and quarters, inch deal boarding for lead, inch deal proper ledged trap-door and inner trap-door, with fastenings and hinges complete.

ers, &c. 4206. To lay to the several roofs, inch yellow deal gutter-boards, on strong fir bearers, with a current of 1½-in. to every 10 ft., 2½-in. drips in the situations shown by the plans, and cess-pools to the heads of the rain-water-pipes. To put to the gutters the requisite ¾ in. yellow deal lear-boards 10 ins. wide.

tered-parti- between the en and the parlour. 4207. Bottom-plate and king-post... ... ... 4½ by 4
Top-plate side-posts door-posts and braces ... ... 4½ — 3
Quarters 13¾-ins. apart ... ... 4½ — 3
4 tiers of inter-ties ... ... 4½ — 1½

tered-parti- running North to h through the ling-house. 4208. 4 tiers of plates to each partition ... ... 4 — 4
Side-posts and door-posts ... ... 4 — 3
Queen-posts and king-posts above the doorways ... 4 — 5
Struts above and between the doorways ... ... 4 — 3
Quarters ... ... 4 — 2
2 tiers of inter-ties to each story ... ... 4 — 1¼

he other tered-parti- 4209. Heads and sills ... ... 4 — 3½
King-posts ... ... 4 — 4
Struts ... ... 4 — 3
Door-posts and end-posts ... ... 4 — 3
Quarters ... ... 4 — 2
2 tiers of inter-ties to each story ... ... 4 — 1¼

ied deal par- is. 4210. To fit up the one-pair story of the stable-offices with 1½-in. square framed partitions as shown by the drawings, and to inclose beneath the principal stair-case with an 1½-in. square framed spandril-partition with a doorway therein.

DOORS, &c.

t entrance. 4211. To fit up the principal front doorway according to the drawings with a fir proper door-case 5 ins. by 4 ins., a 2½-in. deal door hung with three 4 in. butt-hinges and with other ironmongery of the prime cost value of 20*s.*, a 2 in. deal moulded panel and a transom over the door and other proper fittings complete.

parlours nd-story. 4212. To put to the two parlours on the ground-story 2 in. deal four-panel doors moulded on both sides, hung each with a pair of 4 in. butt-hinges and with a very best mortise-lock with plain brass furniture thereto.

n over the en, and -door of ting-house. 4213. To put to the room over the kitchen and to the doorway between the south-west parlour and the counting-house 2 in. deal four-panel doors moulded on one side, hung each with a pair of 3½-in. butt-hinges and with a very best mortise-lock with plain brass furniture thereto.

r rooms on ne-pair story e dwelling- e. 4214. To put to all the remainder of the rooms on the one-pair story of the dwelling-house 2 in. deal four-panel square framed doors, hung each with a pair of 3½-in. butt-hinges.

External ledged doors.

4215. To put to the stable-offices and to the privies inch deal ploughed tongued beaded ledged and braced external doors, hung with very strong cross-garnet hinges in proper fir frames 5 ins. by 4 ins. and with other ironmongery thereto value together 20s. The stable doorway is to have a transom 4 ins. by 3 ins., and above the same upright cast-iron bars 1 in. square placed diagonally not more than 4 ins. apart.

External sashed doors.

4216. To put to the external doorways of the counting-house stair-case and scullery, 1½ in. bead-butt and square-framed sashed-doors, one thereof hung as shown by the plans in 2 in. deal rebated linings 10 ins. wide, and two thereof in fir proper door-cases 5 ins. by 4 ins.; each door is to have a pair of 3½ in. butt-hinges, and each is to have fastenings value 10*s.*; and also a bead-butt and square-framed shutter, with proper frame-work, wrought-iron corner-shoes, dogs, and thumb-screws.

Postern door.

4217. To put to the postern by the South-west corner of the dwelling-house, a 2-in. bead-flush and square four-panel door hung in a fir proper door-case 5 ins. by 4 ins., with three 4-in. butt-hinges and fastenings, value 12*s.* at the prime cost.

Other doors.

4218. To put to the remainder of the door-ways throughout the whole of the premises, 1½-in. four-panel square-framed doors, hung each with a pair of 3-in. butt-hinges, and a good 7-in. iron-rimmed lock, with brass furniture.

Front gates.

4219. To put at the carriage-entrance to the wharf-yard, a pair of gates 8 ft. high, composed of pieces of inch-deal 3 ins. wide, shaped at the top, placed 4 ins. apart, with pieces of inch-deal 5 ft. long and beaded at both edges placed between the same, three ledges of inch deal 5 ins. wide, and braces of inch deal 3½ ins. wide; the gates are to be hung with hinges and fastenings value 3*l.*, to a pair of oak-posts scantling 9 ins. square, and 12 ft. long, with moulded caps, two oak-spurs 3 ft. 6 ins. long scantling 4 ins. by 4 ins., oak-framed ground-sill 6 ins. by 6 ins., and oak braces 6 ins. by 4 ins., the oak-timber placed in the ground is to be pitched completely all over, and the posts are to be pitched to the height of 12 ins. above the ground.

Grounds, architraves, linings, &c.

4220. To put to the door-ways in the deal framed-partitions, deal rounded stops, 3 ins. wide.

To put to the whole of the remainder of the internal door-ways, 1¼ in. single-rebated linings, those thereof more than 10 ins. wide being framed square.

To put to all the external door-ways with door-cases, the requisite inch-deal tongued and rounded linings.

To put to the door-way of the principal room on the ground-story, inch-deal framed grounds, and a moulded architrave 6 ins. wide, according to the drawings.

To put to the three door-ways next the entrance-hall inch-framed and beaded grounds 5½ ins. wide, and mouldings according to the drawings to form architraves.

To put to all the remainder of the door-ways throughout the plastered parts of the dwelling-house, inch deal-framed grounds 4 ins. wide, with mouldings according to the drawings to form architraves.

CHAPTER XLIII.

Closets.

4221. To form closets in the situations shown by the plans, with quartered-fronts, 1⅛ in. doors to correspond on the outside with those of the respective rooms in which the same are put, and hung with 3-in. butt-hinges, and with a good 6-in. iron-rimmed closet-lock, with brass furniture to each; to put to all the closet-doors, linings grounds and mouldings to correspond with those to the room-doors, and to fit up each closet with four tiers of inch-deal shelves as large as the closet will contain, and fixed with the requisite bearers.

Skirtings.

4222. To fit up the principal room with moulded skirting 14 ins. high, according to the drawings.

To fit up the lesser parlour on the ground-story, and the North-east room on the one-pair story, with inch torus-skirting, 10 ins. high.

To fit up all the remainder of the dwelling-house (the scullery excepted) with inch square skirting 8 ins. high.

To fit up the two living-rooms of the stable-offices, with ¾-in. square skirting 6 ins. high.

The whole of the skirtings are to be fixed with ploughed grounds and the requisite backings.

Dwarf wainscotting.

4223. To put round the walls of the counting-house 1¼-in. square framed wainscotting 2 ft. 9 ins. high, finished with beaded-capping, and fixed with the requisite grounds and backings.

Angle-staves.

4224. To put to all the projecting angles of the chimney-breasts proper rebated angle-staves, those of them to the kitchen are to be beaded.

Windows of the stable-offices.

4225. To fit up the whole of the stable-offices with 1¼-in. deal chamfered-bar sashes, double-hung with iron axle-pulleys, iron weights, large patent lines, and patent spring fastenings in deal cased-frames with oak sunk sills.

Windows of the two parlours on the ground-story, and of the stair-case.

4226. To fit up the windows of the two parlours on the ground-story and of the stair-case, with 2-in. deal lamb's-tongue sashes, double-hung with brass axle-pulleys, iron weights, large patent lines, and patent spring fastenings in deal cased-frames with oak sunk sills.

Pantry-windows.

4227. To put to the pantry, a solid fir frame with an oak-sill and filled in with strong copper fly-wire.

Other windows.

4228. To fit up all the other windows throughout the premises with 1½-in. deal ovolo sashes double-hung with brass axle-pulleys, iron weights, large patent lines and patent spring fastenings in deal cased-frames with oak sunk sills.

Sliding shutters, &c.

4229. To fit up the windows of the two parlours on the ground-story, and those of the counting-house and kitchen, with 1¼-in. window-backs framed to correspond with the doors of the respective rooms, and 1¼-in. bead-butt and square-framed sliding-shutters hung as sashes with large patent lines, brass axle-pulleys, and iron weights and thumb-screws in proper deal-cased frames with beaded covers hung with 2-in. butt-hinges.

Window-linings, &c.

4230. To fit up the window of the stair-case with 1¼-in. square-framed and tongued linings; to fit up all the remainder of the windows of the dwelling-house with inch deal tongued linings and to put to the whole thereof inch deal grounds 4 ins. wide, and mouldings round to correspond with those of the door-ways.

To fit up the windows of the two living-rooms of the stable-offices with inch deal tongued and rounded linings.

Stair-case.

4231. To construct the principal stair-case according to the drawings with 1½-in. best clean deal risers steps and landings with moulded returned nosings, 1½-in. beaded cut and mitred string-board, 1¼-in. wall string, strong bracketed carriages, best moulded Spanish mahogany hand-rail with mitred cap, strong square bar dove-tailed balusters (each tenth baluster being of wrought-iron) turned and framed newels, and all requisite inch deal apron-linings and all proper blockings and other fittings complete.

Cistern, &c.

4232. To put in the scullery a dove-tailed cistern-case 2 ft. 3 ins. wide, 3 ft. 3 ins. long, and 2 ft. deep, with 2-in. bottom, 1½-in. sides, and all requisite bearers.

Privies.

4233. To fit up one of the privies with inch clean deal seat and riser and clamped flap and frame, and all requisite bearers and other fittings; and to fit up the other privy for canal-boat-men with an 1½-in. deal front with a grooved and rounded top-rail 4 ins. by 3 ins.

Dresser, &c.

4234. To put in the kitchen a dresser with drawers and shelves complete, value £6.

To put in the scullery by the side of the sink a table-top of 1½-in. deal with all requisite legs and bearers.

Pantry.

4235. To fit up the pantry with two tiers of inch deal shelves 10½ ins. wide, and one lower tier of shelves of the widths shown by the plan, the whole to be fixed with all requisite bearers, standards, legs, and rails complete.

Dust-bin.

4236. To fit up the dust-bin with a sliding door and the other necessary wood-work.

Stable fittings.

4237. To divide the stable with 2-in. deal grooved and beaded stall-boards, with an 1¼-in. rounded deal batten on each side, and with oak grooved bottom-rails 10 ins. wide and oak grooved and rounded top-rails 4 ins. by 3 ins.

To fit up the stable with 1½-in. deal mangers with oak grooved and rounded rails 4 ins. by 3 ins., 14 very strong manger-rings and strong bearers under the mangers.

To provide and fix seven large strong wrought-iron stable-racks.

To put in the loft a corn-bin 3 ft. high and 3 ft. square internal dimensions, of 1¼-in. deal dove-tailed and strongly ledged, the lid thereof hung with a pair of strong trunk hinges, and furnished with a strong padlock with a hasp; and to put from the corn-bin down to the stable, a 3-in. trunk of ¾-in. deal with two slides in order to feed the horses.

[redacted]

APTER XLIII.

gs. 4238. To provide and fix in the stable and in the wharf-yard, four of the smallest sized gully-hole cast-iron gratings used over public sewers.

r. 4239. To provide a strong step ladder to ascend to the roofs.

ic feet of fir (See § 1071.)

g-work. (See § 1070.)

PLASTERER.

plaster, set hiten. 4240. To lath, plaster, set, and whiten, ceilings to the stable and to the two living-rooms above the same, also to the cellar, the kitchen, the scullery, and the pantry of the dwelling-house.

plaster, et and 1. 4241. To lath, plaster, float, set, and whiten ceilings and strings to the whole of the remainder of the dwelling-house and to the counting-house.

led stucco. 4242. To execute in the best floated troweled stucco the sides of the counting-house, and the sides of the entrance-hall, principal stair-case, and the lobby on the one-pair story of the dwelling-house.

plaster, and 4243. To lath plaster and set the quartered-partitions next the kitchen and pantry.

laster, float t. 4244. To lath plaster float and set all the remainder of the quartered-partitions.

r and set. 4245. To render and set the brick-work of the kitchen and of the two living-rooms over the stable.

r float and 4246. To render float and set all the remainder of the brick-work of the dwelling-house, that to the cellar-story excepted.

es, &c. 4247. To run round the entrance-hall, the principal stair-case, the lobby on the one-pair story, and the south-west parlour, plain moulded cornices according to the drawings.

To execute round the ceiling of the principal room on the ground-story of the dwelling-house, an enriched cornice according to the drawings.

ng and ing. 4248. To whiten all the cornices and ornamental-work, and to colour the sides of the kitchen and of the two living-rooms over the stable.

r's cement 4249. To execute in the very best manner in Parker's cement stucco according to the drawings, the dado, the base mouldings, and the sur-base beneath the niches, in the south end of the stable-buildings, and the entablature and pediment over the same; to form in the very best manner in sunk letters the following inscriptions: " " in the paneled entablature, and " " in the dado. The

Parker's cement-work is to be roughly coloured in small pieces immediately that any of it is finished, and is to be pointed in imitation of masonry; and when dry is to be teinted with weather-proof outside-colouring mixed with beer-grounds, Russia tallow, tar, and the other proper ingredients.

PLUMBER.

6 lb. milled-lead gutters, valleys and flat, and to dormer.

4250. To lay all the gutter-boards and valleys with milled-lead weight 6 lbs. to the foot superficial, turned up full 5 ins. high all round next the brick-work and turned up a sufficient quantity next the rafters to reach in height 5 ins. perpendicular.

To lay the flat over the stair-case with 6-lb. milled-lead properly rolled and turned up 5 ins. high.

To cover the top and sides of the dormer with 6-lb. milled-lead, and to put round the same flashings of similar lead 12 ins. average width.

4 lb. milled-lead flashings.

4251. To put round the lead-flat and the gutters flashings of 4-lb. milled-lead 5 ins. wide.

4 lb. milled-lead to hips and ridges.

4252. To cover all the hips and ridges with 4-lb. milled-lead 16 ins. wide properly dressed and secured.

Cast-iron eaves'-gutters.

4253. To put to the projecting eaves of the roofs over the stable-offices and the coal-shed and to the eaves at the northern and western sides of the dwelling-house 4-in. cast-iron eaves-guttering securely fixed on strong wrought-iron brackets, and put together with white lead.

Cast-iron rain-water-pipes. (See § 1104.)

4254. To put five stacks of cast-iron rain-water-pipes 4 ins. bore in the situations shown by the plans, complete with the requisite heads and with shoes leading down to the drains.

Cisterns, &c

4255. To line the cistern in the scullery, the bottom thereof with 10-lb. cast-lead and the sides thereof with 5-lb. milled-lead.

4256. To lay on the water to the cistern with sufficient strong lead $\frac{3}{4}$-in. service-pipe; to put to the cistern a ball-cock, an $1\frac{1}{2}$-in. strong waste-pipe, and a brass cock with a $\frac{3}{4}$-in. pipe thereto to draw water from the cistern to the sink.

4257. To put to the sink in the scullery a strong lead 2-in. waste-pipe with a brass bell grate.

PAINTER.

Preparation.

4258. To knot with silver leaf, stop, pumice smooth in every part, and prepare properly in the most perfect manner, all the wood-work and other works intended to be painted.

Five times in oil to iron-work.

4259. To paint five times with the best oil-colour, all the

columns rain-water-pipes eaves'-gutters railings and other iron-work of the whole of the premises, the first two coats of colour being done with red-lead paint.

Four times in oil to wood-work and stucco.

4260. To paint four times with the best oil-colour all the internal and external wood-work of every kind usually painted of the whole of the premises; and to paint in like manner all the internal stucco-work.

Flatting extra.

4261. To flat extra twice over of such teints as may be directed, the whole of the painted work of the three parlours and of the entrance-hall, of the principal staircase, and also of the lobby on the one-pair story.

General colours, &c.

4262. The outside of the external front door is to be finished in imitation of wainscot finely combed and figured, and is to be twice varnished with the best copal; the sashes are to be finished on the outsides thereof with dark purple-brown; the other painting is to be finished with such teints of stone-colour drab or other plain colours as may be directed.

GLAZIER.

Best glass.

4263. To glaze the windows of the two parlours on the ground-story, and the window of the room over the kitchen, with the best Newcastle crown glass.

Third glass.

4264. To glaze the windows of the stable-offices with good third Newcastle crown glass.

Second glass.

4265. To glaze all the remainder of the windows and lights of every kind throughout the whole of the buildings with good second Newcastle crown glass.

Cleaning, &c.

4266. The whole of the glazing is to be properly bedded, bradded, and back-puttied, and is to be cleaned and left perfect at the final rendering up of the whole premises as complete.

PAPER-HANGER.

Paper 12*d*.
Border 6*d*.

4267. To under-line and hang the best parlour on the ground-story with figured paper value 12*d*. per yard, and border at top and bottom value 6*d*. per yard.

Paper 8*d*.
Border 2*d*.

4268. To under-line and hang with figured paper value 8*d*. per yard, with border at top and bottom value 2*d*. per yard, the south-west parlour on the ground-story and the room over the kitchen.

Paper 5*d*.
Border 1*d*.

4269. To hang with figured paper value 5*d*. per yard, with border at top and bottom value 1*d*. per yard, the whole of the rooms and closets on the one-pair story of the dwelling-house.

CHAPTER XLIV.

SPECIFICATION *for erecting and completely finishing a* WAGGON-OFFICE, *with Warehouses, Stables, Waggon-houses, Cart-houses, Chaise-houses, Covered Ride, and large Pendent Roof under which waggons may stand and be loaded.*

(Insert here a list of the Drawings, see § 986.)

BRICKLAYER.

Removal of the old buildings.

4270. To take down carefully all the old buildings at present upon the site of the intended new buildings and establishment; and to remove and cart away forthwith from the premises, all the old bricks old mortar and rubbish.

Notices, &c. to the District-surveyor, &c.

(See § 987.)

Digging, rubbish, &c.

4271. To excavate the ground for all the foundations drains and other works so requiring; to render the bottoms of all the trenches level and hard; to remove all impediments to the laying of the foundations; and to fill in again consolidate and make up the ground to the proper levels; to remove and cart away all superfluous ground and all rubbish of every kind which may from time to time arise in or about the whole of the buildings and premises, and to leave the buildings and premises finally clear therefrom.

Ground-work.

4272. To perform to the yard, and to the site of the buildings all such levelling, ground-work, and removal of ground, as may be requisite in order to lay the pavings and floors to the proper intended levels.

Brick-work (See §§ 990—1.)

4273. To execute all brick-work which may be requisite for carrying into effect the design of the intended buildings according to the drawings; and to perform and execute all brick-work which may be requisite for rendering the new buildings the old buildings and all the adjoining buildings complete in their connexion together and with each other.

Entire party-wall to be included.

4274. The whole of the intended new West wall of the stable-buildings is to be included in the contract, without question of the value of a portion thereof, which is to be hereafter settled between the holders of the several adjoining premises.

South-wall.

4275. The South wall is to be taken down only so far as the same is defective, but the old brick-work thereof which will be left standing, is to be on both sides and on every part thereof completely repaired, all the defective bricks being cut out therefrom, and the whole of the brick-work being repaired with new hard stock-bricks set in one half new quick Parker's cement and one half clean Thames sand, and all the old mortar-joints being

raked out from the old brick-work, and the whole of the brick-work being pointed with stone-lime blue mortar.

Uncut arches.

4276. To turn through the entire thickness of the brick-work uncut arches and counter-arches wherever the same can be put, the centering being in every instance left up till directed by the surveyor to be eased and finally removed.

Ganged arches (if any.)

(See §§ 4160 and 570—94.)

Yellow facings (if any.)

(See § 4163 and Index.)

White brick facings (if any.)

(See § 3340.)

Common facings.

(See Index.)

Bedding, &c.

(See § 999.)

Air-flues.

4277. To carry up in the brick-work for the ventilation of the stables No. air-flues 9 ins. square worked on the inside thereof quite fairly, and each flue with a cast-iron frame fixed in the brick-work at the bottom thereof, with a valve therein 9 ins. square also of cast-iron hung on pivots to swing vertically; each flue is to be carried up above the roof, and is to have an external orifice on the inside of the parapet above the guttering.

Drain, funnels, &c. (See § 1104.)

4278. To construct in 4-in. brick-work a barrel drain 14 ins. internal, diameter according to the plan, and continued into the public sewer (or as the case may be to such other drainage as may be accessible) and the lower half of the drain stuccoed with pure quick Parker's cement ¾ in. thick. To put to the foot of each of the five rain-water-pipes a brick funnel and a shoot 9 ins. bore stuccoed and in other respects (dimension except) the same as the drains.

Brick-nogging (if any.)

4279. To brick-nog the partitions between the and the

(All brick-nogged partitions near the ground should be raised upon 12 ins. or more in height of brick-work set in Parker's cement. See Index.)

Works in equal measures of Parker's cement and sand.

4280. To inclose the dung-pit with a breast-wall set in new quick Parker's cement and clean Thames sand mixed together in equal measures, and to set thereto in like manner a curb of cast-iron ½ in. thick, with a rim extending down 3 ins. on the inside and on the outside thereof.

To finish the walls of with brick-on-edge and double plain-tile crestings both set in and jointed with new quick Parker's cement and clean Thames sand mixed together in equal measures.

To set in new quick Parker's cement and clean Thames sand mixed together in equal measures the upper course of brick-work below the louvre-boarded openings, under the roofing of the covered ride and of the .

Indents, cutting out, making good, &c.

4281. To cut carefully and parget perpendicular indents in the old brick-work where requisite in order to receive the in-

tended new brick-work, and to make good thereto all the shattered and defective brick-work ; to cut out the brick-work in order to receive the templets gutter-plates tie-beams and rafters and wherever else may be requisite in order to set up and fix the intended works of every kind ; and to repair and make good and complete in a sound and workmanlike manner the brick-work to all such holes and cuttings.

Pan-tiling.

4282. To cover the roofs over the lofts and the with the best new pan-tiling, laid to a close gauge, upon heart of fir fillets, and with all the hip-tiles and ridge-tiles secured by T nails dipped in hot pitch and with strong wrought-iron hip-hooks (dipped also in melted pitch) at the lower angles of the hips ; and to point on the inside thereof in the most effectual manner with stone-lime mortar with sufficient hair therein, the whole of the tiling.

Plain-tiling (if any.) (See Index.)

Lime-whiting. (See § 4177.)

Scaffolding. (See § 2259.)

Jobbing-work. (See § 1011.)

Rods extra brick-work. (See § 1007.)

Bricks. (See § 1008.)

Mortar. (See § 1009.)

Grouting. (See Index.)

Mode of doing the work. (See § 1010.)

MASON. (See §§ 265—295.)

Granite templets.

4283. To put in the western wall of No. pieces of granite curb each 2 ft. 6 ins. long and 10 ins. by 7 ins. (*or better if* 12 *ins. by* 8 *ins.*) to receive the ends of the girders against which the ground will lie and impart damp.

Window-sills.

4284. To put to the windows of the stable-building which open under the covered ride, sills of 3 in. Yorkshire stone in width the whole thickness of the walling, wrought with fair edges on both sides thereof and set so as to stand fair with the back and front of the walling without projection, and so as to form window-stools on the inside of the building.

Granite bases.

4285. To put beneath the iron columns supporting the ends of the great truss of the roof over the waggon-stand two bases of solid granite each containing 2 ft. cube and mortised out to receive the columns.

Yorkshire stone paving (if any). (See § 1130.)

CHAPTER XLIV.

Granite paving to stable-yard (if any.) (See Index.)

Pebble paving (if any.) (See Index.)

Cisterns (if any.) 4286. To put in the yard (*or other situation as the case may be*) a cistern of 2½-in. Yorkshire stone, rebated together, secured by sufficient strong copper cramps, and of internal dimensions ft. ins. long, ft. ins. wide, and ft. ins. deep, and made perfectly water-proof, securely fixed with all requisite bearers, cut out to receive the waste-pipe and as may be otherwise requisite.

SLATER. (See §§ 542—3.)

Dutchess slating. 4287. To cover the whole of the roof of the covered ride and the sloping parts of the roof over the great waggon-stand with the best strong dutchess slates.

Countess slating. 4288. To cover the with the very best strong countess slates.

Bond nails, &c. (See § 1024.)

Pointing. 4289. To point the whole of the slating on the inside thereof with stone-lime mortar with sufficient hair therein.

Reparation. (See 1025.)

CARPENTER AND JOINER. (See §§ 337—40.)

New materials, &c. (See § 1029.)

Timber and deal. (See §§ 1031.)

Sundries. (See § 1032.)

Centering. (See § 2800.)

Bond-timber. (See §§ 1036—8.)

Floors to lofts for stable building. (See §§ 394, 1122, 1723.)

4290. Wall-plates set edgewise ... ... Ins. 6 by Ins. 4
No. girders ... ... 12 — 8
No. cast-iron caps or sockets to ditto, weight each 40 lbs., to prevent the ground against the back of the wall from rotting the ends of the girders.
No. templets each 2 ft. 6 ins. long ... ... 6 — 6
Joists ... ... 6 — 2½
Trimmers and trimming-joists ... ... 6 — 2¾

The floor is to be trimmed to the South wall so that only five joists shall enter the wall (the ground lying also against the back of that wall); and the end of each of the five trimming-joists is to be capped with a cast-iron socket or cap, weight 18 lbs.

	Ins.	Ins.
Floor of 1¼-in. yellow deal listed free from sap-wood, and rebated and filleted on the under side thereof.		

Warehouse flooring.

(See § 3918, and observations, §§ 422 and 4184.)

Roofs over the stable-buildings.

4291. Wall-plates all round (set edgewise) with no joints except at the angles of the walls .. 5 by 4

No.	tie-beams	9 — 4
No.	angle-ties each 6 ft. long	5 — 3
No.	dragon-pieces to ditto	5 — 2½
Rafters	.. ..	5 — 2½
Ridges and hips	.. ..	8½ — 1

Roofs over the covered ride and the great waggon-stand.

4292. Two cast-iron columns for the support of the ends of the great bearing-truss under which the waggons are to drive (about 20 ft. long each), 6 ins. diameter at bottom, 5 ins. diameter at top, and with caps, bases, and plates, as shown by the drawings.

2 oak corbeilles to support the two tie-beams each 4 ft. long wrought all over, and shaped	15 — 1 2
2 tie-beams extending from column to column above the corbeilles and forming with the queen-posts principals and other timbers a pair of united trusses	12 — 6
4 queen-posts	8 — 6
4 external principals	5 — 6
2 collar-beams	9 — 6
2 principals, between the tie-beams and the other timbers forming the pair of united trusses ...	7 — 6
1 king-post to ditto	9 — 6
Quarters and plates to make out the trusses to receive the covering entablature and the back-linings next the gutters	4 — 2 ½
Entablature and dressings as shown by the drawings, with inch Honduras mahogany frieze and panel or king-piece on the architrave under the frieze.	
Inch yellow deal tongued linings over the top of the truss and round the back of the truss down to the gutter; and all requisite cradling and backs of yellow deal.	

4293. *This description of trussed-work, on account of the considerable space of the pendent part of the roofing, both in front and rear, should be cambered to a considerable degree: the example from which this is taken was erected by the author with a span of about 30 feet each way; two of the sides only of the square being supported upon walls, and those walls not opposite each other, and one side being quite open and unsupported except at the angles. The camber of the great front bearing truss was at first 3 ins., but this subsided to only 1½ in. when the transverse trusses, the slates, the lead-work, and the other adjuncts were added, and after shrinkage of the timber had occurred.*

Two transverse trusses running from East to West, to be wrought fairly all over.

4294. 2 tie-beams ... ... 12 by 5

2 templets each 4 ft. long at the West end of the tie-beams ... ... 6 — 6

[redacted]

APTER XLIV.

	Ins.	Ins.
4 queen-posts	10 by	5
4 principals	6 —	5
2 collar-beams	9 —	5
4 side-braces	5 —	3
4 centre-braces under the collar-beams	5 —	4

s, &c., to

4295. Gutter-plate at the north-west part of the principal roof 24 ft. long, wrought on three sides .. .. 9 by 14

Ditto 22 ft. long between the principal trussed roof and the minor roofs over the yard, wrought on three sides .. .. 10 — 14

Two ditto each 13 ft. long between the minor roofs over the yard, wrought on three sides each .. 4 — 12

Templets to ditto (average length 2 ft.) .. .. 9 — 6

Pole-plates where requisite .. .. 5 — 4

Blocks to support ditto over the inner tie-beams of the front great bearing-truss and where else requisite.

Four angle-ties to the principal roof over the yard, each 7 ft. long ... . 12 — 3

Four dragon-pieces to ditto ... . 12 — 2½

No. angle-ties to , each 5 ft. long .. 5 — 3

ring of roofs.

4296. Two plates or bearers at the east and west sides of the entire flat to receive the heads of the rafters .. .. 10 by 4

11 joists to the centre-flat .. .. 6 — 2

Furrings to form currents and 2½-in. drips, and inch yellow deal boarding for lead to ditto listed free from sap-wood.

Rafters ... ... 6 — 2

Trimming-rafters to skylights ... ... 6 — 3½

4 hips rounded for lead ... ... 10½ — 1½

2 ridges to minor roofs... ... ... 8 — 1¼

¼-in. yellow deal slate battens 2¾ ins. wide to the rafters of the principal trussed roof over the yard.

10 sky-lights of 2-in. deal with chamfered bars, inch beaded linings round the well-holes, and all proper frame-work and fittings complete; the two sky-lights next to the dwelling-house are to be prepared to receive large glass.

Each of the larger sky-lights is to have a wrought-iron bearing-bar 2 ins. by ¾ in. across the well-hole, and each of the smaller sky-lights is to have a wrought-iron bearing-bar 1½-in. by ¾ in.

rrs.

4297. To lay all the roofs with gutter-boards of inch yellow deal listed free from sap-wood, and fixed upon strong yellow deal brackets, with currents as shown by the drawings 1½ in. to every 10 ft. run, and with 2½-in. rebated drips; the gutters are to be in general of the widths shown by the plans, and in their narrowest parts are to be in no instance less than 12 ins. wide, except be-

tween the minor roofs over the . A cess-pool is to be formed over the head of each rain-water-pipe.

Lear-boards.

4298. To put against the rafters to all the gutters, lear-boards of ¾-in. yellow deal 10 ins. wide.

Brick-nogged Quartered-partitions.

4299. To put between quartered partitions reaching from the floor to the tiling of the roofing, with bottom plates 4¼ ins. by 6 ins., queen-posts and collar-plate 4½ ins. by 4½ ins., and posts and plates raking below the rafters 4½ ins. by 3 ins., quarters 13½ ins. apart 4½ ins. by 2 ins., and five tiers of inter-ties 4½ ins. by 1½ in.

Lantern-light to inner stable and loft above.

4300. To construct and fit up a lantern-light as shown by the drawings, with four corner-posts 7 ins. square, to go down and serve also as heel-posts, and with cast-iron socket-bases; rounded guard-rails 4 ins. by 3 ins. fixed about 3 ft. high all round above the loft-floor to serve as a guard to prevent persons from falling from the loft through the well-hole down into the stable; diagonal braces 2½ ins. square framed instead of balusters between the guard-rails the floors and the corner-posts, and with intermediate posts 3½ ins. square; bottom and top plates all round the four sides of the lantern, each 5 ins. by 4 ins.; four angle-ties, each 2 ft. 9 ins. long 3 ins. by 2½ ins.; rafters to the lantern-top 2 ins. by 3 ins.; four hips of inch yellow deal 6½ ins. wide; 1½-in. yellow deal bevil-bar sashes 3 ft. high, all round the four sides of the lantern, hung on centres with cut and mitred fillets, strong cords, muntin-posts 3 ins. by 3½ ins. between the sashes, and all other fittings complete; and to put to the lantern-light all linings and other work of every requisite kind.

C. View.
d. Plate-base.
e. Sides of the socket.
f. Mortise for the insertion of the timber.

Framed deal partitions (if any.)

(See Index.)

Door-ways.

4301. To fit up the doorways of the stables, lofts, and warehouses with fir proper door-cases scantling 5 ins. by 5 ins., with circular segmental heads, and inch yellow deal wrought ploughed cross-tongued and beaded doors, ledged and braced with inch deal, and hung with strong wrought-iron 24-in. cross-garnet hinges, and with a 10-in. best copper-warded stock-lock with 2 keys to each; the doors are to be folding, and are to have to each pair of doors two strong 10-in. rod-bolts; and each of the upper doorways is to have a threshold of 2-in. oak 12 ins. wide rounded in front.

Cast-iron sashes and frames.

4302. To provide and fix in the window-openings of the stable-buildings and warehouses No. cast-iron sashes according to the drawings, with bars 1¼ in. by ⅝ in. average, and with cast-iron frames in substance equal to 1½ in. by 1¼ in., with eight flanges 2½ ins. long to each frame, to be inserted in the brickwork; the lower sashes of the stables and the upper sashes of the warehouses are to be hung on centres, and are to have fastenings and elevating racks complete; the other sashes are to be fixed.

CHAPTER XLIV.

Cast-iron mangers.

4303. To provide and fix all along the of the stalls of all the stables, very strong cast-iron continuous mangers with strong rims *(the substance of the iron may be stated)* with iron brackets and iron bearers complete.

Cast-iron racks.

4304. To provide and fix securely all along over all the mangers of the stables, continuous ranges of cast-iron racks the whole length of the several stables, with frames one inch square, and bars one inch diameter and not more than 3 ins. apart.

Stall-boards. (See Index.)

Corn-room, &c. (See Index.)

Louvre-frames, &c.

4305. To provide and fix in the gable-walls, below the roofs over the covered ride, five large semicircular fir proper frames 5 ins. by 5 ins. with oak sunk sills 5 ins. by 4 ins. filled in as shown by the drawings with inch yellow deal louvre-boarding 6½ ins. wide.

Stairs.

4306. To erect the stair-cases to the ware-houses and to according to the drawings, with treads and landings of 2-in. oak ploughed and cross-tongued, and 1½-in. deal risers, framed into 2-in. deal string-boards, and with newels of fir (*or they may be of oak*) 3½ ins. square wrought framed and chamfered, framed and rounded hand-rail of fir 4 ins. by 3½ ins. (*or of oak, as the case may be*), diagonal braces of deal 2½ ins. square wrought and framed to serve as balusters.

Step-ladders (*if any*) *in a large establishment regular stair-cases are to be preferred.*

4307. To provide and fix in the stables No. step-ladders with steps of 1½-in. oak, framed into sides of 2-in. deal; and to put at the sides of the step-ladders wrought framed and rounded guard-rails securely fixed with strong deal standards.

100 ft. extra fir timber. (See § 1071.)

Jobbing-work. (See § 1070.)

PLASTERER.

4308. To lath with heart of fir lath-and-half laths, and plaster, float, set, and whiten ceilings to the covered ride and to the roof over the great waggon-stand.

PLUMBER.

7-lb. milled-lead to gutters and flats. (See § 3725.)

5-lb. milled-lead 18 ins. wide, to hips and ridges of slated roofs. (See § 3016.)

4-lb. milled-lead flashings, 5 ins. wide. (See § 4250.)

5-lb. milled-lead flashings round sky-lights. To put round each of the sky-lights, flashings of 5 lb. milled-lead 12 ins. average width properly secured.

4-in. cast-iron R. W. pipes. (See § 4254.)

3½-in ditto. (See § 3504.)

3-in. ditto. (See § 3822.)

Eaves'-guttering (if any.) (See § 4253, and Index.)

Cistern. To line the cistern, the bottom thereof with 10 lb. cast-lead and the sides thereof with 6 lb. milled-lead.

Cisterns may be made of stone or of slate, for which see Index.

Laying on water. 4309. To lay on the water from to the cistern with strong lead-pipe one inch bore, with a strong brass cock with a proper floating ball and a boss thereto, and to put to the cistern a strong waste-pipe 2 ins. bore with a proper brass socket.

PAINTER.

Four times in oil. 4310. To knot, stop, smooth in every part, prepare properly, and paint four times with the best oil-colour, all the wood sashes, window-frames, sky-lights and sky-light-frames, doors and door-frames, the entablature and linings upon the great bearing-truss, and all the other internal and external wood-work usually painted.

Five times in oil. 4311. To prepare properly and paint five times with the best oil-colour the whole of the iron-work of every kind of the whole of the buildings, the first two coats of colour being red-lead paint.

Colours. 4312. The whole of the painting is to be finished of such teints of stone-colour as the surveyor may direct.

GLAZIER.

4313. To glaze all the sashes, windows, and sky-lights of all the buildings with good second *(or third, as the case may be)* Newcastle crown-glass properly bedded, bradded, and back-puttied.

To clean and leave perfect all the glazing at the final rendering up of all the buildings as complete.

CHAPTER XLV.

SPECIFICATION *for erecting and completely finishing an additional* COURT OF STABLE-OFFICES *(for a Nobleman) adjoining to the East side of the present stable-offices of* *agreeably to the drawings attached to and forming part of the Contract, and according to such further explanatory detail Drawings as may be hereafter given.*

(Here to follow a list of the Working-Drawings, see § 986.)

BRICKLAYER.

site. 4314. To take down all the present erections of every kind upon the site of the intended new buildings, and to level the ground thereof.

ng, cartage, 4315. To dig out for all the foundations, the drains, the dung-pit, and for the execution of the other intended works according to the drawings, and as by occasion may be required; to cut all the trenches level, and to render the beds thereof hard and solid; to fill in the earth again and to ram the same down in a proper manner; to make up the ground both within and without the buildings, so as to adapt the same properly to the several floors, pavings, roads, paths, and the grounds adjoining to the stable-offices; and to cart away all the superfluous earth and all rubbish and useless matters which may from time to time accrue in or about the building from the several works, and to leave the premises finally clear therefrom; the ground is to be excavated 12 ins. below the surface of the kitchen floors.

al brick- (see §§ .) 4316. To execute all brick-work which may be requisite for carrying into effect the buildings and works according to the drawings in every respect, and so as to render the whole of the buildings and premises complete; and so as to finish adapt and unite the new buildings to the old buildings.

arches. (See § 3834.)

ng. (See § 999.)

es. 4317. To construct to each stall of the stables and to each loose-box stable, two air-flues 9 ins. square, carried up within the thickness of the brick-work from over the racks, and brought out to the external air on the inside of the parapet above the gutter with a syphon-top to prevent wet from beating thereinto.

eys. 4318. To properly turn parget and core all the flues, to put to each fire-place on the ground-story a brick fender 9 ins. thick to support the slab, to put to each of the other fire-places a 4-in. brick trimmer at least 18 ins. longer than the chimney-opening, to carry up the chimney-shafts and to face the same with white

bricks, and to put over each flue a large sized chimney-pot moulded in clay and burnt white.

Facings of white bricks.

4319. To face with the best white bricks (every heading-brick being carried through into the work with proper bond) so much of the external walls as will require facings in order to make the new stable-buildings to correspond in manner with the stable-buildings already erected; and to face in a similar manner every part of the new buildings towards the court.

Gauged arches. (See §§ 358, 370—94.)

4320. To put to all the external openings in the brick-work towards the court, gauged arches according to the drawings, 8 ins. wide on the face, and composed of white brick burnt clay wedges rubbed and set in the closest possible manner.

To put arches to the external walls of the building to correspond with those of the other parts of the stable-buildings already erected.

Dung-pit.

4321. The breast-wall of the dung-pit is to have a footing in four courses of 18-in. brick-work, and is to be from thence upwards 6 ft. high and 13½ ins. thick.

Four rods of brick-work in addition.

(See § 1007.)

Bricks.

(See § 1008.)

Mortar.

(See § 1009.)

Grouting, &c.

4322. The whole of the brick-work is to be entirely flushed in at every course with mortar, and is to be grouted with liquid mortar at every alternate course of work, particular care being taken that the facings thereof may not be stained.

Mode of doing the work.

(See § 1010.)

Cut indents, &c.

4323. To cut and parget in the old brick-work perpendicular indents where requisite for receiving the new walls, chimneys, and other brick-work.

To cut out for and make good with new brick-work, recesses in the old walls for the hay-racks.

Kitchen floors.

4324. To build 4-in. cross-walls 15 ins. high to receive the kitchen paving, and to put piers 12 ins. high, 9 ins. by 4 ins., not more than 3 ft. apart to receive the sleepers of the kitchen floors.

Drains.

4325. To construct barrel drains in 4-in. brick-work as shown by the plan, 18 ins. internal diameter, and stuccoed on the inside over the lower half thereof with new pure quick Parker's cement ¾ in. in thickness.

(See § 1104.)

To put a brick funnel from each rain-water-pipe, waste-pipe, and stable-grating to the drains.

To put to each of the iron gratings in the paving of the stable-court a funnel formed with a large stench-trap below the moveable iron grating.

To put to each of the privies a large brick hopper cemented all over with Parker's cement.

To put to the drains four large additional stench-traps in such situations as may be directed.

Scaffolding, &c. (See § 2259.)

Reparation of accidents, &c. &c. &c. 4326. To perform in a workmanlike manner the alterations and reparations of all kinds, and also the pointing and colouring to the brick-work of the adjoining premises immediately in contact with the intended new buildings, so far as the same may be found requisite.

(See § 1111.) To repair in a workmanlike manner, all damage which may occur to the brick-work of the old buildings by reason of the performance of the new work; and to repair in like manner all damage caused to the new bricklayer's work by accident, settlement, or otherwise during 12 calendar months after the buildings are rendered up as complete.

Dutch clinker paving. 4327. To pave the whole of the loose-box stables, and the whole of the other stables, and the farriery, with real Dutch imported clinkers, of an approved sample, laid in manner of herring-bone upon a stratum of coarse gravel 6 ins. deep, and grouted three times over completely with stone-lime and sand; the paving is to be laid with proper currents and is to be groined to every stall of the stables.

Forges. 4328. To erect two forges with iron-work, fire-bricks, and every proper appertenance complete in the manner of those at

(A minute description of the work may be inserted as intended to be executed.)

MASON. (See §§ 265—95.)

Granite sub-bases to heel-posts. 4329. To put a cubic sub-base of granite measuring 12 ins. on each side, to receive each of the 16 iron columns in the stables and farriery.

— stone string-course. 4330. To put all round the new buildings towards the court a moulded continuous string-course of stone 12 ins. high, 10 ins. thick on the bed beneath the windows, and 7 ins. thick on the bed at all the other parts thereof; and the whole thereof to have proper sunk water-joints plugged with lead.

— stone cornice. 4331. To put all round the walls of every kind next the new court a cornice of stone 15 ins. by 6 ins., with proper sunk water-joints plugged with lead.

— stone battlements. 4332. To put all round the inclosure walls of the new buildings, and all round the walls towards the intended court, continuous battlements of ———— stone 6 ins. average thickness, wrought and carved to correspond with the battlements of the present stable-buildings, and secured by sufficient copper cramps run with lead.

Chimney copings.

4333. To cope all the chimney-shafts with 4-in. saddle-backed and throated copings of ———— stone.

Sills.

To put to the windows of the ground-story ———— stone sunk weathered and throated sills 6 ins. by 9 ins., those of them to the stables are to be moulded in front.

Coping to privy-walls.

4334. To cover the inclosure-walls, and the division-walls of the privies with 3½-in. Portland stone saddle-backed coping throated at both edges thereof

Steps, &c.

4335. To put to each external doorway of the buildings, a step formed of granite parallel square curb 12 ins. by 8 ins. mortised out to receive the feet of the door-case: the granite curbs forming the door-steps of the coach-houses are to be in pieces as long as possible, with copper joggles run with lead in all the joints thereof.

Slate-linings.

4336. To line the backs of all the mangers of the stables with sawn slate 1½ in. thick and 2 ft. 6 ins. high, secured by strong copper screws; and to line the bottoms of all the mangers with similar slate.

Sinks.

4337. To put to each of the kitchens a sink of Yorkshire stone 7 ins. thick, containing 10 ft. superficial; and to put in each chamber a sink containing 7 ft. superficial of Yorkshire stone 6 ins. thick: the whole of the sinks are to be fixed complete, and are to be cut out for the waste-pipes and grates. To put in each of the two small kitchen-yards a five-hole sink-stone wrought out of a piece of 4-in. Yorkshire stone 4 ins. thick.

2½-in. Yorkshire stone-paving.

4338. To pave the two small yards, the two larders, the bottoms of the stair-cases, and the coach-houses, with 2½-in. Yorkshire stone paving laid in regular courses, with all the edges of the stone wrought smoothly and square through the whole thickness thereof.

Rubbed Yorkshire stone-paving.

4339. To pave the kitchens (the wood floor of each kitchen 9 ft. by 14 ft. excepted) with 2½-in. rubbed Yorkshire stone in regular courses, with the edges thereof also rubbed quite fairly through the whole thickness of the stone.

Chimney-pieces.

4340. To put to the two kitchen fire-places 2-in. Portland stone jambs and mantles 12 ins. wide.

To put to all the other fire-places 1½-in. Portland stone jambs mantles and shelves 6 ins. wide.

To put to each fire-place a hearth of 2½-in. Yorkshire stone, and a slab of 2-in. Portland stone 18 ins. wide and 18 ins. longer than the chimney-opening.

Holes, rebates, &c.

4341. To cut all rebates, chases, holes, back-joints, grooves, and fair-edges, and to perform all the other labour requisite for the perfect completion of the mason's work and for the adaptation thereof to the other works.

[redacted]

4342. The whole of the stone is to be of the best quality, free from shakes vents and all other defects; and is to be laid in the buildings so as to be compressed in the same manner as in the natural beds of the quarries. The contractor is to provide let in

and run with lead all requisite cramps of copper or of gun-metal, and all requisite plugs also of copper or of gun-metal, and no cramps and plugs of iron are to be used in any part of the work on any account whatever.

ration of lents, and ding off the . (See x.)

4343. The whole of the work is to be warranted finally perfect, and should any damage occur by reason of frost or accident within ——— calendar months after the completion of the buildings, all such damage is to be made good by the contractor as the architect shall direct.

The whole of the mason's work is to be cleaned off when directed shortly prior to the general completion of the buildings.

ng of court.

4344. To prepare the ground of the whole extent of the new court or stable-yard, by putting thereon sufficient hard materials; and to pave over the whole surface of the new court or stable-yard with new *half-sovereign* Aberdeen granite carriage-way paving properly dressed, each stone being 8 ins. deep and sorted, 5 ins. wide at both top and bottom thereof; the whole of the paving is to be laid with such currents as may be found expedient, upon full 4 ins. in depth of good rough gravel, and to be completely grouted over the top and between the joints thereof with stone-lime and river sand; the whole of the paving is to be thoroughly rammed 3 times over, and such parts thereof as may sink within 12 months after the same are laid are to be properly relaid and made good.

SLATER. (See §§ 542—3.)

tess slating.

4345. To slate the whole of the roofs of the new buildings with, &c. (*See* §§ 1023—4.)

ration.

4346. To repair all damage which may occur to the slating of the present buildings by the execution of the new works; and to repair all damage which may occur to the new slating; and finally to leave perfect at the rendering up of the whole of the buildings, the new slating and the old slating so far as dependent on the new building and the operations of erecting the same.

CARPENTER AND JOINER. (See §§ 337—40.)

materials.

4347. To provide new materials for and frame and fix all carpenter's work and joiner's work of every kind (complete with all proper ironmongery of the best quality) which may be requisite for carrying into effect and for finishing in every respect all the intended buildings and works according to the drawings, and to connect the new buildings with the old buildings to which they are to be attached.

mith's work.

4348. To fix all the smith's work required for the carpenter's work and joiner's work.

er and deals.

(See § 1031.)

None of the rafters, joists, ceiling-joists, and quarters, are to be respectively more than 11 ins. apart.

Hoarding.

4349. To erect and maintain sufficient hoarding for inclosing the buildings during the carrying on of the works, and so as to prevent inconvenience on the ground and in the present buildings, and to the neighbouring public ways.

Centering.

(See § 2953, and Index.)

Sundries.

(See § 1032.)

Casing to stone-work.

4350. To case up all the stone-work in manner sufficient to preserve the same from injury during the carrying on of the works.

Bond-timber. (See § 1038.)

4351. To put all round in the brick-work of the ground-story of the buildings, four complete tiers of fir bond-timber scantling 4 ins. by 2½ ins., and to put all round in the brick-work of the upper story of the buildings, two complete tiers of similar bond-timber: the whole of the bond-timber is to be without joints except at the angles of the walls.

Wood-bricks.

4352. To put such wood-bricks as may be requisite for fixing the various finishings.

Lintels. (See § 1041.)

4353. To put to all the horizontal door-heads and to such other parts of the buildings as may so require fir lintels 5½ ins. high, 18 ins. longer than the bearing, and of the width of the respective walls.

Floors to one-pair story.

	Ins.	Ins.
4354. Wall-plates	6	by 4
4 girders over the coach-houses	13	—13
2 ditto to kitchens		
Inch deal tongued and beaded casings to the girders.		
Joists notched upon the girders and heel-posts ...	8	— 2¼
1 girder over the farriery	15	—12
Joists notched upon ditto	10	— 2½
Templets 7 feet long	6	— 6
Trimmers	10	— 3
1¼-in. yellow deal floors of half-boards listed free from sap-wood.		

Floors to centre parts of kitchens 9 ft. by 14 ft. each, and to privies.

4355. Oak sleepers	5	— 4
Oak joists	5	— 2½
1½-in. rebated and filleted flooring of yellow deal listed free from sap-wood.		

Sound-boarding.

4356. To put sound-boarding between the joists of the entire one-pair story of ¾-in. deal chopped into pieces not more than 1½-in. wide and fixed with single fillets.

Roofs.

	ins.	ins.
4357. Plates	6	by 4
Binders or ties not more than 4 ft. apart 65 in number,	9	— 4
19 angle-ties and 19 dragons (containing in the whole 250 feet run)	6	— 4
Rafters	6	— 2½
Ditto to larders and privies	4	— 2
Ridges and hips rounded for lead	10	— 2
3 valley-pieces	8	— 4

Gutter-plate over the harness-room (15 ft. long)	..	12 by 8
Joists to flat framed into ditto	..	12 — 2

Inch yellow deal boarding to ditto with furrings.
Inch yellow deal state-battens 2½ ins. wide.

ners. 4358. To put nine dormers in the roofs over the passages each 3 ft. 6 ins. wide inside, and as high and long as the situations will admit of, with the tops thereof boarded with inch yellow deal, one with a proper ledged door, the other eight fitted up with 1½-in. sashes all round to form lantern lights, one sash to each thereof being hung as a casement; and each dormer is to be lined on the inside thereof with inch matched and beaded deal.

ers. 4359. To form the gutters of 1¼-in. yellow deal free from sap-wood, 12 ins. wide at the narrowest parts laid upon strong bearers, with 2½-in. rebated drips, and current 1½-in. to ten feet; the gutters are to have 1 in. yellow deal lear-boards 10½-ins. wide, and also a cess-pool over each rain-water-pipe.

rtered-parti- 4360. Plates .. .. Ins. 4½ by Ins. 4
s. 1050—2.) Posts .. .. 4½ — 3½
Braces .. .. 3½ — 3½
Quarters .. .. 4½ — 2¼
2 tiers of inter-ties .. .. 3 — 1¼

tings. 4361. To skirt the whole of the chambers closets and passages of the one-pair-story with inch deal 8½-ins. high, with proper ploughed grounds and backings.

ngs. 4362. To line the sides of all the loose-box stables and other stables of the coach-houses harness-rooms stair-cases kitchens and privies, with inch yellow deal matched and beaded and fixed with the requisite backings.

nk windows. 4363. To put to the blank windows of the North front of the buildings, sashes and frames similar to those of the corresponding wing of the same front of the stable-buildings already built.

4364. *These are here given, though in general blank windows are the marks of bad and uningenious architecture.*

dows. 4365. To fit up all the windows over the doors and also those ranging therewith above the imposts, with 2½-in. yellow deal ornamental sashes, hung vertically on centres, in solid fir frames 4 ins. by 5 ins. with oak sunk sills 4 ins. by 3 ins. and mitred beads withinside and withoutside: each sash is to have a brass button.

To fit up all the other windows with 2 in. yellow deal ornamental sashes according to the drawings hung complete with large patent lines, brass axle-pulleys iron weights and patent spring fastenings in deal cased-frames with oak sunk sills.

dow-linings. 4366. To put to the whole of the windows 1¼-in. tongued linings with mouldings 4 ins. girth.

s. 4367. To fit up the coach-houses with wrought gate-posts

13 ins. by 7 ins., let at bottom into cast-iron box sockets 8 ins. high and weight 28 lbs. each, and jointed at the tops thereof with 5 lb. milled-lead into breast-summers 13 ins. by 12 ins. cased all over with inch yellow deal and with mouldings 12 ins. girth according to the drawings; and to provide and hang thereto 3 gates framed according to the drawings, bead-flush on both sides, and with approved hinges and fastenings of the value of 12*l.* to each pair of gates.

External doors, &c.

4368. To put to all the external door-ways fir proper door-cases 5 ins. by 4 ins. with transoms where requisite 4 ins. by 3 ins.; and to hang therein 2½-in. four-panel doors framed bead-flush on both sides thereof, with a best 10 in. draw-back iron rimmed lock, and three 4 in. butt-hinges to each. To put to the doors where the architect shall direct eight 10 in. barrel-bolts.

Internal doors, &c.

4369. To fit up all the internal door-ways with 2 in. four-panel square framed doors, hung with 3½-in. butt-hinges and 7 in. iron rimmed locks with brass furniture, in 1¼-in. single-rebated linings with mouldings 4 ins. girth round on each side thereof.

Wood jambs.

4370. To put to the piers of the archways across all the passages 1¼-in. beaded jamb-linings.

Coach-houses.

4371. To put to each coach-house along the whole length of the paving, a pair of wheel-boards of 2 in. oak plank 10 ins. wide with rounded filleting of oak 3 ins. by 2½-ins. effectually screwed on at one edge of each wheel-board.

Stables.

4372. To case the binders over the heel-posts with inch tongued and beaded deal; to put round the walls of all the loose-box stables and other places, a fascia-board to correspond with the casing of the binders; and to put at the top of all the fascia-boards and casings to the binders a deal moulding 6 ins. girth, to form a cornice.

Mangers.

4373. To fit up all the stables of every kind, with mangers of 2-in. deal tongued together, with rollers of cast-iron 3 ins. diameter suspended on centres in brass sockets and other proper mountings, so as to form revolving cappings to the manger-fronts.

Stall-boards, &c.

4374. To form the stall-boards in three thicknesses of 1¼-in. deal, beaded and nailed together, capped on the top thereof with cast-iron ramped rails, fixed with strong screws: the stall-boards are to be tongued into grooves cast in the iron heel-posts. To put to each stall of the stables and to each loose-box stable, two brass rollers in iron frames, each value 2*s.* 6*d.*, and also a manger-ring of the very best quality.

Racks, &c.

4375. To put to each stall of the stables and to each loose-box stable a hay-rack formed with a bottom mesh composed of fillets, and a frame 3 ins. by 2½ ins., filled in with ash staves 1¾-in. diameter ferruled (*i. e. collared with iron*) and hung with pins and sockets; to put beneath each manger a bead-flush 1¼-in. closet-door 2 ft. square, hung with 2-in. butt hinges and a button, in order to let out the seeds from the rack.

CHAPTER XLV.

Bins. 4376. To form the bins of the extent shown by the drawings, in twelve divisions, of 1½-in. deal ploughed tongued and framed together, and the tops thereof formed into 12 flaps, hung in beaded frames, with a pair of 2-in. butt-hinges and a strong lock to each.

Gratings. 4377. To put in the paving of each stall of the stables, and to each loose-box stable, a copper grating 8 ins. square weight 4 lbs., set in an oak frame 4 ins. by 3 ins.

Harness-rooms. 4378. To fit up the harness-rooms all round with 1¼-in. double-moulded rails 6 ins. wide, and 80 framed harness-pins value 2*s.* each.

Angle-beads. 4379. To put to all the projecting angles of the brick-work rebated angle-staff beads 1¼-in. diameter.

Stair-cases. 4380. To construct the stair-cases according to the drawings, with 2-in. deal treads and 1¼-in. deal tongued risers and landings, housed into 2-in. deal string-boards; and to put on each side of each stair-case a half hand-rail of wainscot.

Closets. 4381. To form the closets at the sides of the fire-places, as shown by the plan, with 1½-in. square framed fronts, and 1¼-in. square framed doors hung each with a pair of 3-in. butt hinges, and a 6-in. strong iron rimmed lock; to put in each closet three tiers of inch deal shelves 10 ins. average width, with proper bearers. The closets inclosed by quartered-partitions, are to have doors and fittings complete the same as the other closets.

Privies, &c. 4382. To fit up the privies and water-closets, with 1¼-in. clean deal seats and risers with all proper bearers, and inch clean deal clamped flaps and frames, the flaps hung with 2-in. brass butt-hinges.

Cisterns. 4383. To put over each sink, a dove-tailed cistern-case capable of containing 12 cubic feet of water, fixed with all proper bearers, and each with a cover of ¾-in. deal rebated beaded and ledged, and with a wood handle.

Dressers. 4384. To put in each kitchen a dresser with drawers and shelves complete value £12.

Larders. 4385. To fit up the larders with 150 ft. superficial of 1½-in. shelfing, fixed with sufficient brackets and bearers, and to put therein also drawers dressers bins or other fittings in value £10.

200 ft. cube fir in addition. (See § 1071.)

Jobbing-work. (See § 1070.)

SMITH.

Chimney-bars. 4386. To provide a wrought-iron chimney-bar 4 ins. by ¾ in. for each of the kitchen fire-places, and a wrought-iron chimney-bar 2½ ins. by ½ in. for each of the other fire-places.

Cast-iron column heel-posts.

4387. To provide and fix 13 heel-posts in the stables, and three similar posts in the farriery, each of cast-iron 5 ins. average diameter, with a small base let at bottom into the granite sub-base, an ornamental leaf-capital at top, and furnished with two swivel bridle-rings to go in or out at will; the heel-posts are also to be cast with grooves to receive the stall-boards.

Coping to dung-pit.

4388. To provide a complete cast-iron coping for the wall of the dung-pit ¾ in. average thickness, and returned down on both sides of the wall 4 ins. at least.

1120 lbs. iron-ties. (See 1703.)

4389. To provide 10 cwt. of wrought-iron in such ties bolts and other work as may be requisite for the carpenters and bricklayers.

6 cast-iron gratings and frames for court 6 cwt.

4390. To put in the paving of the court six cast-iron gratings in detached frames each weight 1 cwt.

14 stacks of 3½-in. R. W. pipe. (See 1104.)

4391. To provide and fix fourteen complete stacks of 3½-in. rain-water-pipe, with heads and shoes complete to lead from the gutters to near the drain-funnels.

Ventilators.

4392. To put in the fronts of the stables 12 copper ventilators 9 ins. by 12 ins. and weight each 10 lbs., and each also with an internal copper valve value 10*s.*; and to put to each of the flues above the racks a similar valve.

PLASTERER.

L. P. F. S. and whiten ceilings.

4393. To lath, plaster, float, set, and whiten ceilings to the whole of each story of the buildings.

L. P. F. S. and colour.

4394. To lath, plaster, float, set, and colour of a teint of stone-colour the whole of the quartered-partitions of the chambers, closets, passages, and other parts of the buildings not intended to be lined with wood.

Rendering.

4395. To render, float, set, and colour of a teint of stone-colour the whole of the internal brick-work of the buildings not intended to be lined with wood.

Arrises beads and quirks.

4396. To execute and run all requisite arrises, beads, and quirks.

Lathing.

4397. The whole of the lathing is to be done with lath-and-half heart of fir laths.

Pugging.

4398. To pug one inch in thickness with stone-lime mortar (with sufficient hair therein) the whole extent upon the sound-boarding between the joists of the one-pair story.

CHAPTER XLV.

PLUMBER.

8 lb. milled-lead gutters to flats, &c.

4399. To lay all the gutters, chimney-gutters, and valleys, and the small flat over the farriery with milled-lead weight 8 lbs. to the foot superficial, turned up 6 ins. at all the brick-work and 10 ins. against the rafters.

4 lb. milled-lead flashings.

4400. To put 4 lb. milled-lead flashings 5 ins. wide to all the gutters.

4 lb. milled-lead to hips and ridges.

4401. To cover the hips and ridges with 4 lb. milled-lead 18 ins. wide properly secured.

6 lb. milled-lead to sky-lights and dormers.

4402. To put round all the sky-lights 6 lb. milled-lead flashings 15 ins. wide; and to cover the tops and sides of the dormers with similar lead turned up 10 ins. high all round over the roofs.

Make good lead-work of present buildings.

4403. To repair and make good the gutters and other lead-work of the present stable-buildings so far as dependent upon the new buildings or in any way damaged altered or affected by the erection thereof.

5 lb. milled-lead flashings to coach-house.

4404. To cover the wood mouldings over the coach-house doors with 5 lb. milled-lead 12 ins. wide.

Waste-pipes, &c.

4405. To put to all the sinks strong 2½-in. lead waste-pipes leading into the drains, and with strong brass bell grates complete.

2 pumps.

4406. To put in the stable-court two 3-in. pumps with neat cast-iron cases, proper strong lead suction-pipes to bring a sufficient supply of water from the well in , and all other requisite work and appertenances of every kind.

2 water closets. *(See Index.)*

4407. To fit up two water-closets with white basins, Bramah's patent valve apparatus, D traps, service-pipes, and all requisite fittings of the best quality complete.

Cisterns.

4408. To line the cisterns, the bottoms thereof with 8 lb. milled-lead, and the sides thereof with 5 lb. milled-lead; to lay on the water thereto, and also from thence to each sink with sufficient ¾-in. strong lead pipe (and proper pumps if requisite, in which case add a proper description thereof), and brass cocks balls and all other needful fittings complete.

PAINTER.

3 times to iron-work.

4409. To paint five times with the best oils white-lead and colours, the whole of the iron-work, the first two coats of colour being red-lead paint.

4 times in oil.

4410. To knot, stop, prepare properly, and paint four times with the best oils white-lead and colours, the whole of the wood work and other works throughout the premises, the floors and rough timbering thereof excepted.

Colours.

4411. The whole of the external painting is to be finished in colours the same as those of the external painting of the present stable-buildings; the other painting is to be done with such plain teints of stone-colour as may be directed.

GLAZIER.

2nd Newcastle glass.

4412. To glaze with good 2nd Newcastle crown glass, properly bedded bradded and back-puttied, the whole of the windows sashes and lights of every kind.

To clean and leave perfect all the glass immediately before the rendering up of the building as complete.

CHAPTER XLVI.

SPECIFICATION *for the erection of Buildings for the purposes of a* BREWERY-ESTABLISHMENT *(the mash-tun thereof capable of brewing* 10 *quarters of malt at once, and capable of being altered to contain* 50*-barrel coppers), at and for the performance of other works therewith connected, for* .

(Insert here list of Working-drawings, see § 986.)

BRICKLAYER.

Notice, &c. to District-surveyor. (See § 987.)

4413. To give to the District-surveyor the requisite notices for the erection of a first-rate building, and for the erection of a fourth-rate building, and to pay to him his proper official fees.

Digging.

4414. To excavate and remove the ground, rubbish, old foundations, and other obstructions which will require removal in order to form the cellarage, and for constructing and executing the intended new foundations and the other intended new works; to beat down, ram and render hard and level the bottoms of all the trenches for the reception of the intended new foundations and brick-work, and when the foundations and brick-work are executed, to fill in and consolidate the ground in and about the foundations, walls, and other brick-work, as may be found requisite according to the several situations of the work.

Disposal of ground.

Rubbish, &c.

4415. To remove, dispose of, and make up to such levels and in such situations upon the ground-plot of the premises as the surveyor may direct, all the superfluous earth which will result from the excavations, and also all rubbish of every kind which will arise from time to time in and about the buildings; and to

leave finally the buildings clear from rubbish, and to leave the whole of the ground fair and neat.

4416. To bale out, draw off, and remove from all the site of the intended works, such water as may come thereon from rain or from other causes during the progress of the foundation-works, and cellar-works; and to remove also from the site of the intended buildings and works, all soft soil and mud which may at any time during the progress of the works be found thereon.

ld bricks.

4417. To take down and remove such of the present brick-work as will require removal in order that the intended works may be executed; and to clean properly and use in the new work such of the bricks (not exceeding 10,000) so to be taken down and removed, as will be found good and sound.

hases, &c.

4418. To cut out in the most careful manner in the present brick-work which will adjoin to the intended new brick-work, such perpendicular chases and indents as may be requisite for the reception of the intended new brick-work, and to parget well the same; and to make good all damage which may be caused to the brick-work by cutting the chases and indents therein.

4419. To cut out the brick-work wherever the same may be requisite in order to perform properly and to fix adapt and make complete the several intended works; and to make good thereto in a neat sound and workmanlike manner, with new brick-work properly bonded into the old brick-work.

oncrete-work.

4420. To form under each of the two copper-chimneys, a foundation, consisting of a block of concrete-work 10 ft. square and 3 ft. thick; and to fill up the whole of the two spandrils of the arch over the beer-cellar with concrete-work extending all over the extrados or back of the whole arch.

(If the spandrils are to be formed of brick-work as stated in § 4428, the spandril-work is to be omitted from the concrete-work.)

4421. The concrete-work is to be formed of the coarse and fine gravel dug out and found upon the premises, with one measure of powdered stone-lime (to be provided by the contractors) added to every six measures of gravel; the gravel is to remain unscreened.

eneral new ick-work. ce § 991.)

4422. To execute in the very best manner all brick-work which may be requisite in order to form and to complete the intended new buildings and offices and their appertenances, and to carry into effect thoroughly completely and perfectly the intended additional buildings alterations and other intended works according to the drawings, and so as to render the buildings, offices, and premises, with their walls and appertenances, complete and finished n every respect.

5 cwt. iron hooping.

4423. To provide and work up in the new foundations piers and such other parts of the intended new brick-work as the surveyor shall direct, 5 cwt. of strong wrought-iron vat-hooping in order to strengthen the work.

Blocks round under the iron pilasters at the head of the copper-house.

4424. To form under the cast-iron pilasters round the head of the copper-house, blocks in brick-work as shown by the drawings.

Projections.

4425. To form in brick-work properly cut and set, the several projections according to the drawings.

Bedding.

4426. To bed in mortar all the plates, lintels, bond-timber, and other works so requiring; and to bed and point with lime and hair mortar all the window-frames and door-frames.

Vaultings.

4427. To construct according to the drawings, the vaultings of the intended cellarage and of the copper-stages, set as closely as possible, grouted well and completely with liquid mortar; and to clean off and strike neatly the joints of the soffits of the vaultings.

(See § 2528.)

4428. The skew-backs of the vaulting are to be formed by corbeilling out the brickwork, so as that no part of the vaulting shall intersect the main substance of the springing-walls. (*If the spandrils be formed of concrete work, as described in* § 4420, *this clause is to be omitted.*)

4429. To fill in with layers of bricks thoroughly embedded in liquid mortar, over the backs of the copper-stage vaultings solidly and level quite up to the tops of the outsides or extrados of the vaultings.

Piers of malm paving-bricks.

4430. To build the detached piers of the cooperage and the four piers of the copper-house, of the best hard malm paving-bricks: those of them to the cooperage are to be set in one half new quick Parker's cement and one half Thames sand.

Facings, &c.

4431. To face the South front of the mashing-loft between the stone-work with malm paving-bricks of bright and uniform colour, bonded in every course properly into the other brick-work; and to face all the remainder of the external brick-work including the gateways with neat picked stocks of uniform colour with gauged arches to the windows next the garden.

Chimneys.

4432. To properly turn, parget, and core the two flues from the counting-house and the vacant apartment; to put to each of the chimneys a wrought-iron chimney-bar 2 ins. by $\frac{1}{2}$-in.; to finish the two chimney-shafts as shown by the drawings, and to put to the chimney of the counting-house a fender of 9-in. brick-work 15 ins. high for the support of the slab.

Pan-tiling. *(Pan-tiling is preferred by many for the covering of a brewery, from the ventilation which it affords: others prefer slating, with the sides of the slates placed 2 or 3 inches apart; this is called by some "half slating.")*

4433. To cover the roof over the cooler-house, grinding-loft, mashing-loft, horse-wheel, copper-house, and coal-house, with the best sound new pan-tiling laid dry to a proper gauge upon heart of fir laths, and with the hip-tiles and ridge-tiles set in Parker's cement, each fixed with a T nail dipped in melted pitch and with a proper wrought-iron hip-hook dipped in melted pitch at the foot of each hip.

Drainage.

4434. To perform such drainage-work to the value of five pounds as the Surveyor may direct. *(For other drainage-work see §§ 1001—4 and Index.)*

1 rod extra brick-work.

4435. To provide and execute under the contract one rod reduced of the best grey stock brick-work, to be used as the Surveyor shall direct in extra works not hereby intended to be done in the necessary works of the intended new brewery and of the buildings, offices, and appertenances thereof, the value of such of the said extra brick-work as may not be directed to be used is however to be deducted from the amount of the consideration of the contract after the rate of per rod reduced; and any further quantity of extra brick-work which the Surveyor may direct is to be executed by the contractors at the like price of per rod, except the fire-work to the coppers, which is to be estimated according to the cost and labour thereof.

Bricks.

(See § 1008.)

Mortar.

(See § 1009.)

Mode of doing the work. (See § 1010.)

4436. All the external work and the other work not intended to be concealed are to be finished quite fairly, and are to have the joints thereof very neatly drawn.

Lime-whiting.

4437. To lime-whiten twice the whole of the internal brick-work of the buildings except of the coal-cellar, and except also of the gateways; and to lime-whiten twice the internal timbers and roofing generally of all the buildings.

Jobbing-work.

4438. To perform to the intended new works and in adapting the same to the old works, all such bricklayer's work as may be requisite thereto in the nature of jobbing.

MASON. (See §§ 265—95.)

Stage between the coppers.

4439. To form the stage between the coppers of 2¼-in. Rock-Hill paving *(or with Castle-hill paving)* stone with sawn joints.

In the original design for the buildings, a vault was intended to have been carried between the wort-copper and the liquor-copper for the support of the stoke-hole-stage, but on consideration the proprietor of the establishment directed the

stoke-hole-stage to be rendered moveable for the convenience of renewing the coppers.

Window-sills. (See § 1014.)

4440. To put to the two windows next the garden, sills of 3½-in. Yorkshire stone 9 ins. wide, wrought fairly, throated, and laid sloping.

Granite string-course.

4441. To provide and bed all along the West and South sides of the mashing-loft a string-course composed of the best Aberdeen granite square and parallel curb 12 ins. by 8 ins., finely tooled at the joints and over the external surfaces, weathered on the top, throated on the under side, set edge-wise to project 2½-ins. and plugged with lead at all the joints thereof.

Granite sill to coal-house.

4442. To provide and bed in the gateway of the coal-house a sill 8 ft. 6 ins. long of Aberdeen granite parallel square curb 12 ins. by 8 ins., set edge-wise, and cut out to receive the gate-posts.

Portland stone-work to the entrance front.

4443. To provide work and fix to the entrance-front of the building, the facings to the plinths quoins and gateway, the frieze, the cornice, and the window architrave, all of the best hard Portland stone, secured by being plugged with lead, and by sufficient copper cramps: the stone of the plinth is to be 9 ins. thick, that of the quoins and frieze is to average 6 ins. thick, the cornice is to be of stone scantling 1 ft. 9 ins. by 8 ins., the stone of the piers of the gateway is to be 12 ins. thick, the arch-stones of the gateway are to be solid the whole thickness of the soffit of the arch, the cornice is to be formed with proper sunk water-joints channeled and run with lead, the arch-stones of the gateway are to be set with plates of 4 lb. milled-lead in all the joints thereof, the plinths are to be finished with very large tooled channeling, and all the other parts of the work are to be rubbed quite smooth.

6-in. granite paving. (For other carriage-way paving see §§ 3893—5, 4194, and 4344.)

4444. To alter, level, lower, make up, and prepare properly, the ground of the gateway under the mashing-loft, and of the six archways immediately connected therewith, as may be found requisite; and to provide and lay down thereon sufficient of the very best new Aberdeen granite carriage-way paving full 6 ins. deep, the under side of each stone thereof is to be in superficial extent not less than two thirds of that of the upper side thereof: and the whole of the paving is to be laid close stone to stone upon a bed of coarse ballast 3 ins. deep, and is to be thoroughly grouted all over and between the joints thereof with stone-lime and Thames sand, and the work is to be twice thoroughly rammed all over.

4445. The contractor is to provide and complete as much 6 in. granite paving as last described as the surveyor shall direct: all additions to the quantity of the said paving and also all deductions therefrom are to be taken at the rate of per yard superficial, including the grouting ballast and all other attendant labour and materials.

Chimney-piece, &c.

4446. To put to the counting-house chimney, jambs and mantle of 1¼-in. Portland stone 5 ins. wide, a shelf of 1¼-in. Portland stone 6 ins. wide, a chimney-slab of 2 in. Portland stone 18 ins. wide, and a back-hearth of 2 in. rubbed Yorkshire stone.

CHAPTER XLVI.

SLATER. (See §§ 1023—8.)

Countess slating.

4447. To cover the upright sides of the grinding-loft with the very best strong countess slates, lapped full 3 ins. with proper bond regular and similar in every part thereof: and to repair make good and leave finally perfect to the satisfaction of the surveyor the whole of the slating.

CARPENTER AND JOINER. (See §§ 337—40.)

New materials.

4448. To provide sufficient new materials for, and frame, fix, and finish all carpenter's work and joiner's work which may be requisite in order to erect the intended new brewery, and to complete and carry into effect all the other intended works with their several fittings and appertenances.

Ironmongery.

4449. To provide for all the carpenter's work and joiner's work, and use and fix thereto, all requisite hold-fasts, wall-hooks, spikes, nails, brads, screws, and other proper and necessary ironmongery, and to provide and fix properly all the requisite brass-work, hinges, locks, and other fastenings. The whole of the ironmongery is to be of the very best quality.

Sundries.

(See §§ 1032—3.)

4 cwt. iron-ties, &c.

4450. To provide and fix in and about the intended works 448 lbs. avoirdupoise of wrought-iron in such straps, ties, screw-bolts, and other light wrought and hammered work as the surveyor may direct: all additions to the said quantity and all deductions therefrom are to be taken after the rate of
per pound avoirdupoise including the trouble and expense of fixing the same.

Centering.

4451. To provide, fix, ease when so directed, and finally remove all centering and turning-pieces which may be requisite for constructing the arches of stone and brick and the vaultings and trimmers of every kind.

Bond-timber.

4452. To put round the walls of the coal-house and of the counting-house and vacant apartment, one tier of fir bond-timber properly lapped and spiked.

Gutters, &c.

4453. To form the gutters and valleys with inch yellow deal gutter-boards laid to a current of not less than 1½ in. to every 10 ft.; and to put thereto lear-boards of ¾-in. yellow deal 10 ins. wide, and also the requisite tilting-fillets.

Roofs over the coppers.

4454. To construct the two roofs over the coppers with

	Ins.	Ins.
Plates	4 by	3
Rafters	3 —	2
Ridges	8 —	1

Roofs over the horse-wheel, cooler-house, refrigerator, and grinding-loft.

4455. To construct the roofing over the horse-wheel, cooler-house, refrigerator, and grinding-loft with

	Ins.	Ins.
Plates	4	by 3
Diagonal-ties each 4 feet long	4	— 3
Tie-beams	9	— 3
Rafters	3	— 2
Ridges	7	— 1
Valley-piece	5	— 3
Curb-rafters at bottom	5	— 2½
Ditto at top	4	— 2½
Braces to ditto	4	— 3½
Kings to ditto	6	— 4
Story-posts	5	— 5

Roof, &c. over the mashing-loft. (2 framed timber trusses.)

4456. To construct the roof over the mashing-loft with

Plates	4	by 3
Diagonal-ties each 4 feet long	4	— 3
2 tie-beams	9	— 4
4 principals	5	— 4
4 queen-posts	6	— 4
2 collar-beams	6	— 4
Purlins	7	— 5
Rafters	3	— 2
Ridge	7	— 1
2 bearers under the turret	9	— 6

Turret.

4457. To form the turret over the mash-tun according to the drawings with louvre-boarding, curved rib-work in two thicknesses of inch deal, and with inch yellow deal straight and spherical boarding, and all requisite other fittings and appertenances.

Roof over the coal-house. (2 framed timber trusses.)

4458. To construct the roof over the coal-house with

Plate	4	by 3
Diagonal-ties each 4 feet long	4	— 2½
2 tie-beams	9	— 4
2 king-posts	9	— 4
4 Principals	6	— 4
Purlins	7	— 5
Rafters	3	— 2
Ridge	7	— 1

Cooler-floors. *(It is usual for the maker of the plant to provide the joists immediately under the coolers.)*

4459. To provide and fix in the cooler-house three girders of fir 12 ins. by 8 ins. and wrought breast-summers 9 ins. by 5 ins. with ¾-in. deal fascia-boards thereto; and to put over the counting-house, ceiling-joists 3½ ins. by 2 ins.

Mash-tun stage. (2 framed timber trusses.)

4460. To provide and fix for the support of the mash-tun two girders of fir 9 ins. by 14 ins.; four principals 9 ins. by 6 ins.; four queen-posts 9 ins. by 9 ins.; two collars 9 ins. by 9 ins.; and two bearers under the tun 8 ins. by 5 ins.

(In this instance the principal gateway of the establishment is directly under the mash-tun; but a direct perpendicular support is to be preferred for the very great weight of the mash-tun and its contents.)

To form the mash-tun stage with joists 8 ins. by 3 ins.; trimmers 8 ins. by 4 ins.; wall-plates 5 ins. by 4 ins., and 1½-in. yellow deal boarded-floor ploughed and tongued.

HAPTER XLVI.

inding-loft or.

4461. To construct the floor of the grinding-loft with plates 9 ins. by 5 ins., and joists 7 ins. by 2½ ins., and to lay the whole of the flooring with 1¼-in. yellow deal ploughed and tongued.

To provide and fix in order to receive the horse-wheel, a fir girder 15 ins. by 12 ins., and 19 ft. 6 ins. long.

unting-house or, skirting, &c.

4462. To fit up the counting-house with joists 3 ins. by 2 ins. upon oak sleepers 4 ins. by 3 ins., not more than 4 ft. apart, and upon brick piers; and to lay the joists with 1¼-in. yellow deal boarded floor clear of sap-wood: to put round the counting-house inch deal square skirting 8 ins. high, and to put rebated and beaded angle-staves to the angles of the chimney-breast, and round the door and window.

or-ways.

4463. To put to the counting-house and to the four other openings in the side of the gateway, five 2-in. bead-flush and square-framed four-panel doors in fir proper door-cases 4 ins. by 4 ins., with 3½-in. butt hinges, and with an 8-in. iron-rimmed draw-back lock, with brass furniture, to each door.

4464. To fit up the front central opening of the mashing-loft over the arched gateway out of which the grains are to be cast with a 2-in. bead-flush and square-framed sashed door glazed with second Newcastle crown glass and hung in a fir proper door-case 4 ins. by 4 ins. with 4-in. butt hinges and two 10-in. rod-bolts.

al-house gates.

4465. To fit up the coal-house with a pair of inch deal ploughed cross-tongued beaded and strongly ledged and braced gates, hung in fir wrought and rebated posts 8 ins. by 6 ins., and fir wrought and rebated head 8 ins. by 9 ins., with hinges and fastenings value £3.

indows.

4466. To fit up the window of the counting-house and the two windows of the grinding-loft, with 1½-in. ovolo sashes glazed with second crown glass, and double-hung with large patent lines, iron weights, brass axle-pulleys, and patent spring fastenings in deal cased-frames with English oak sunk sills: and to put round the windows the requisite inch deal tongued and beaded linings.

uvres.

4467. To fit up the cooler-house, the copper-house, the mashing-loft and the turret over the same, with inch yellow deal wrought louvre-boards 8 ins. wide, set in fir proper frames 5 ins. by 4 ins., with English oak sunk and throated sills 6½ ins. by 3 ins. The louvre-boards are to be made to turn and to fix conveniently, and are to have all requisite fittings and appertenances.

bbing-work.

4468. To perform to the new work and in adapting the same to the old work all such carpenter's work and joiner's work as may be requisite thereto in the nature of jobbing.

cubic feet of fir aber extra.

(See § 1071.)

SMITH.

Cast-iron eaves'-guttering.

4469. To provide and fix all round the eaves of the roofing over the cooler-house, grinding-loft, and mashing-loft, 3-in. cast-iron trough-gutters put together with white-lead and fixed on sufficient strong wrought-iron brackets.

Rain-water-pipe.

4470. To provide and fix from the eaves'-guttering to the ground, three complete stacks of cast-iron rain-water-pipe 3½ ins. bore, and two complete stacks of cast-iron rain-water-pipe 2½ ins. bore: all the pipes are to have proper cast-iron heads and shoes.

Cast-iron bases.

4471. To provide and fix for the support of the story-posts seven cast-iron shoe-bases weight together 8 cwt. and 35 lbs.

C. View.
d. Plate-base.
e. Sides of the socket.
f. Mortise for the insertion of the timber.

Iron girders.

4472. To provide and fix for the support of the stage between the coppers, two girders of cast-iron, weight together 12 cwt. *(or give an exact drawing of the girders.)*

PLASTERER.

Counting-house.

4473. To lath, plaster, set, and whiten a ceiling to the counting-house; and to finish the walls of the counting-house with the best troweled stucco teinted stone-colour.

PLUMBER.

Gutters and valleys.

4474. To lay the gutter-boards and valleys with milled-lead weight 6½ lbs. to the foot superficial, turned up full 5 ins. next the brick-work and full 10 ins. next the tiling.

Flashings.

4475. To put in the brick-work round the gutters and valleys the requisite flashings of 4 lb. milled-lead 5 ins. wide.

Turret.

4476. To cover the cupola and the base of the turret with 6½-lb. milled-lead seamed as shown by the drawings, turned up full 5 ins. at all the sides against which the same is dressed, and turned down full 8 ins. wide all round over the tiling.

PAINTER.

4477. To knot, stop, prepare properly, and paint four times with the best oil-colour, the whole of the louvre-frames, louvre-boards, breast-summers, doors, windows, iron pipes and gutters, and other internal and external wood-work, iron-work, and other works usually painted, both of the inside and of the outside of the several buildings and of their offices and appertenances.

CHAPTER XLVII.

CIFICATION *for the erection of and the entire completion, fit for use and occupa-*
on, of a FIRE-PROOF *House or Building with the appertenances thereof for the*
Managers of the SAVINGS' BANK *upon a*
lot of ground situate in in the Parish of
the County of

(*Insert here a list of the Working-drawings, see* § 986.)

BRICKLAYER.

ice, &c. to
rict-surveyor, (See § 987.)

ging and
ind-work. 4478. To excavate and remove the ground, rubbish, old foundations, and other obstructions which will require removal in order to execute the intended new foundations, drains, areas, and other intended new works; to beat down, ram, and render hard and level the bottoms of all the trenches for the reception of the intended new foundations and brick-work; and when the foundations and brick-work are executed, to fill in and consolidate the ground in and about the foundations, walls, and other brick-work as may be found requisite according to the situations and nature of the several walls and other works.

lage, &c. of
bish, &c. (See § 989.)

4479. To bale out, draw off, and remove from all the site of the intended works, such water as may come thereon from rain or other causes, during the progress of the foundation-works, and all soft soil and mud which may at any time during the progress of the works be found thereon.

eral brick-
k. 4480. To execute in the very best manner all brick-work which may be requisite for forming and for completing the intended house or building with the offices and appertenances thereof, and for carrying into effect thoroughly completely and perfectly the intended works according to the drawings and so as to render the house or building with the offices and appertenances thereof complete and finished in every respect.

mneys. 4481. To properly turn parget and core all the flues, to put to each fire-place on the basement-story a brick fender 4 ins. thick and 9 ins. high, to support the chimney-slab with a foundation 6 ins. high and 9 ins. thick; and to put to each of the other fire-places which will not have other vaulting beneath the same a 4 in. brick trimmer 12 ins. longer than the chimney opening.

To carry up and finish the chimney-shafts as shown by the drawings, and to put over each flue a large-sized white chimney-pot of burnt clay in nature similar to white bricks, and set in Parker's cement and burnt clay white tile flanching.

Vaulting. (See §§ 349. 468—476. 508, and 2528.)

4482. To vault with solid brick-work the whole of the basement story, the two entrance halls, and the principal passages on the ground story, the one-pair story, and the two-pair story, in the several manners shown by the drawings; the whole bonded and set in the closest possible manner and with the spandrils thereof carried up in the manners shown by the drawings and properly prepared to receive the pavings and other floorings intended to be laid upon the same; and the whole thoroughly grouted with liquid mortar so as to be entirely sound and solid.

The skew-backs are in general to be formed by corbeilling out the courses of the brick-work so that the backs of the arches may be disengaged from the internal upright line of the walls.

Cuttings, &c.

4483. To cut and execute all requisite splays, skew-backs, groin-points, cores, and other necessary angular and oblique work; and to cut carefully and parget in the adjoining old brick-work such indents as may be requisite for carrying the new brick-work thereinto.

Rough arches.

4484. To turn rough arches and counter-arches wherever the same can be put, set in the closest possible manner, and carried through the entire thickness of the respective walls, except where in certain instances it may be found expedient not to continue the rough arches through to the external surfaces of the work, all the external rough arches are to be finished with neat tuck-pointing.

White brick facings. (See §§ 358—360.)

4485. To face with the best square hard-burnt and perfect fine real Suffolk white bricks, with all the heading-bricks of the facings carried through into the body of the brick-work in every possible instance, the whole of the exposed external brickwork of the Eastern front of the building, from the level of the public road-way upwards, with all the returns thereof; and to face in like manner all over all the chimney-shafts of the whole of the building, except the backs thereof: all the facings are to be finished with neat joints accurately struck.

White brick gauged arches. (See § 593.)

4486. To put to the openings in the walls described to be faced with white bricks, gauged arches composed of hard white brick burnt clay wedges, accurately rubbed and set in the manner practised at Chelmsford and elsewhere.

White brick cornice.

4487. To execute in fine white bricks, moulded according to the drawings, and set in the closest and neatest possible manner, the parts of the upper external dentil-cornice, which are not intended to be of stone: each enrichment of the bed-mouldings of the cornice is to be formed upon the head of one white brick while soft, and to be afterwards thoroughly burnt.

Other facings.

4488. To face all the remainder of the external brick-work with picked stocks of a light uniform colour, with the joints thereof neatly struck and drawn.

CHAPTER XLVII.

Drainage. (See §§ 1001—1004.)

4489. To construct drains according to the plan, and to continue the same into the public sewer, and to pay to the commissioners of sewers their charges for entrance to the sewer, and for all such work, labour, and materials as they themselves, or their officers, contractors, and workmen may use in and about the intended new drains, and in connecting the same with the public sewer. The principal new drain is to be 18 ins. in bore, the other drains are to be 14 ins. in bore, and all the drains are to be composed of 4 in. brick-work, and the lower half of each of the new drains is to be stuccoed on the inside thereof ¾ in. thick, with new quick Parker's cement without sand.

(See § 1104.)

To construct to each area and at the foot of each soil-pipe, and waste-pipe, a proper shoot leading into the drainage, composed of brick-work set in Parker's cement.

To construct to the drains two large stench-traps formed of brick-work and Yorkshire stone set in pure quick Parker's cement, and stuccoed all over the inside also thereof with pure quick Parker's cement.

To perform in addition to the other drain-work already described, such additional drain-work to the value of *5l.* as the architect shall direct.

Piers under floors.

4490. To put under all the sleepers of the floors, brick-piers with the centre of one pier distant not more than 3 ft. 6 ins. from the centre of the next pier, and four courses high, the lower course thereof being 9 ins. square, and the other three courses thereof being 9 ins. by 4½ ins.

Bedding, &c. (See § 999.)

Tile-cresting, &c. in Parker's cement.

4491. To finish with two courses of plain tile-cresting and brick-on-edge, all bedded in and jointed with the best new quick Parker's cement and clean Thames sand mixed together in equal measures, all the walls which will not be covered by stone copings, or by cornices, or by projecting eaves.

1 rod extra brick-work. (See § 1007.)

Bricks. (See § 1008.)

Mortar. (See § 1009.)

Mode of doing the work. (See § 1010.)

Lime-whiting.

4492. To lime-whiten twice the whole of the internal brick-work of the basement-story of the premises, which is not intended to be plastered.

Scaffolding, &c. (See § 2259.)

Jobbing-work. (See § 1011.)

MASON. (See §§ 265—95.)

Basement stair-case.

4493. To construct the basement-stairs with treads and risers of the best compact 3-in. tooled Yorkshire stone paving, wrought with fair tooled edges, pinned securely into the brick-work, and with their outer ends supported upon a wall of stock brick-work 9 ins. thick, with a foundation 13½ ins. thick and 6 ins. high, set 15 ins. below the upper surface of the basement paving.

Other stair-cases. (See § 1453.)

4494. To construct the steps and landings of the other two stair-cases, entirely of the very best and hardest Portland stone with moulded nosings and fair rubbed soffits, the bottom step thereof being solid and parallel, the other steps being feather-edged tailed full 9 ins. into the brick-work and lapped on each other full 1½ in., and the landings thereof being full 4 ins. thick and tailed 4 ins. at the least into the brick-work, the landing of the principal stair-case being in only two stones joggled and run thoroughly together with lead, and each of the other landings being in one slab of stone.

Craig leith steps, &c.

4495. To put to the principal two front entrances on the ground-story, steps and landings of the very best solid hard and compact Craig-leith stone, wrought all over and rubbed all over their external edges and upper surfaces, the steps of scantling 6½ ins. by 13 ins., and the landings 4 ins. thick and each in one stone, and with the requisite risers also of Craig-leith stone.

To put to all the other external doorways of the building, the best solid hard and compact steps of Craig-leith stone, scantling 7 ins. by 13 ins., properly back-jointed and pinned in, and with mortise-holes cut therein for the reception of the lead sockets of the door posts.

Portland stone area-curb.

4496. To provide and bed for the support of the iron palisading of the front area a curb of the best hard and compact Portland stone scantling 6 ins. by 8 ins., no stone thereof less than 3 ft. 6 ins. long, wrought and rubbed fairly all over the ends and three sides thereof, and plugged together with lead at the joints therein.

Portland stone window-sills.

4497. To put to all the front windows, sills of the best hard and perfect Portland stone of the several forms shown by the drawings, properly sunk weathered and throated, and lapped under the oak sills of the sash-frames 2 ins. at the least; the narrowest of the said sills are not to be less than 9 ins. wide.

To put to all the other windows, sills of the best Portland stone, 9 ins. by 4 ins., properly sunk weathered and throated.

Palladian windows.

4498. To construct the three Palladian window-dressings according to the drawings, with bases, shafts, entablatures, and archivolts of the best hard Portland stone, and with foliage capitals of Coade's artificial stone properly modeled and thoroughly burnt as nearly as possible to the colour of Portland stone; each shaft is to be in one stone, and each archivolt is to be in three stones; all the stone-work is to be set with plates of 4-lb. milled-lead between the same and the sash-frames in order to prevent the wood-work from rotting by reason of the moisture of the stone; the bases, shafts, capitals, architraves, cornices, and archivolts, are

to have plates of 4-lb. milled-lead and strong copper plugs set in all the joints thereof; and the joints in the archivolts are also to be run with lead.

4499. To provide, fix and render complete to the principal front of the building, all the following work of the very best perfect and weather-proof Portland stone.

Plinths of Portland stone. The fascia or plinth beneath the external rustic pilasters and beneath the returns and wings of the front, of stone 12 ins. wide on the face and 8 ins. wide on the bed thereof, properly throated and weathered with proper sunk water-joints, and channeled plugged and run with lead.

Pilasters of Portland stone. 4500. The external rusticated pilasters, the bases and capitals thereof not less than 14 ins. wide on the bed.

Portland stone ashlaring. 4501. The rusticated façades and arches of the two wings of the building, the rusticated returns to the same, and the rustic-work between the pilasters, to be of stone ashlaring bonded well into the brick-work, the average thickness of the stone being 7 ins.

Portland stone continuous base. 4502. The moulded continuous base corresponding with the bases of the pilasters, and running beneath the ashlaring; of stone 9 inches wide on the bed thereof.

Architrave of Portland stone. 4503. The fascia or architrave over the pilasters wings and returns last described; the thickness of the stone thereof being 4 ins.

Lower cornice of Portland stone. 4504. The cornice immediately over the fascia last described of stone 2 ft. 2 ins. wide on the bed thereof, channeled plugged and run with lead.

Blocking of Portland stone. 4505. The blocking-course or plinth immediately above the cornice last described, of stone 5 ins. wide on the bed thereof, weathered and plugged with lead.

Dados of Portland stone. 4506. The external dados and the moulded plinths thereto, under the three Palladium windows.

Quoins of Portland stone. 4507. The rustic quoins at the angles of the central façade, bonded in alternate layers in the manner shown by the plan of the one-pair story.

Upper fascia of Portland stone. 4508. The fascia immediately under the upper cornice to the principal façade and to the two returns thereof of stone 5 ins. thick.

Upper external cornice. 4509. To put to the upper external cornice as shown by the drawings, the fillets, and also the moulded blocks for the support of the corona and cyma-recta of cast-iron containing the front gutter, all of Portland stone.

Two lantern lights. 4510. To construct the plinths and architraves of the two lantern-lights entirely in the best hard Portland stone, wrought and moulded according to the drawings, with a strong copper cramp in every joint of the plinths, with a copper plug in each of the horizontal joints and arch-joints of the stone-work, the

whole of the stone-work securely run together with lead, and with the dome-work and lights thereof also run thereinto with lead.

Bases for the iron columns.

4511. To put under each of the cast-iron columns, a base of Yorkshire stone, 4 ins. thick, and containing 2 ft. superficial.

Skew-backs.

4512. To provide and fix over the cast-iron columns, or story-posts of the principal front, eight skew-backs of the best hard Yorkshire stone properly wrought, and of dimensions 9 ins. high, 15 ins. wide on the face, and 18 ins. thick.

Granite templets.

4513. To provide and set in the walls beneath the iron wall-plates, immediately under the end of each of the iron-girders, and of each iron roof-truss, a templet of granite square street curb 12 ins. by 8 ins., and 3 ft. 6 ins. long.

Chequered pavements.

4514. To pave upon the brick-vaultings, the two entrance-halls, the principal stair-case, the landings of the two stair-cases on the one-pair story, and the passage on the one-pair story, with the very best hard perfect white and dark grey stone paving, such as is used at Leamington Priors, in Warwickshire, laid in chequers and with borders according to the drawings, and sanded perfectly smooth on the edges, and upper surface thereof.

(*This description of paving is laid down in Warwickshire for only 8d. per ft. superficial.*)

Tooled Yorkshire-stone paving.

4515. To pave the yards and areas, and the whole of the basement-story of the building (except such parts thereof as are intended to be floored with wood), with the best compact Yorkshire stone paving, full 2½ ins. thick, wrought perfectly fairly on the edges all through the whole thickness of the stone, and laid in regular courses in stone-lime mortar spread under the paving full 8 ins. wide to every joint thereof, except to such of the paving as is to be laid upon cross-walls, in which case the mortar-joints are to spread under the paving 4 ins. wide.

Rubbed Yorkshire stone paving.

4516. To pave upon the brick vaultings the passage of the two-pair story, and the flooring under the counter in the offices, with the best hard compact rubbed Yorkshire stone paving, in regular courses, and full 1½ in. thick.

Sinks.

4517. To put in the scullery, and in one of the kitchens, two sinks of 7-in. Yorkshire stone, 3 ft. long, and 2 ft. wide, pinned into the brick-work, and cut out to receive the waste pipes and bell-grates.

To place in each of the areas and yards, a sink-stone 2 ft. square, and 4 ins. thick, with a 9-in. cast-iron square trapped grating let thereinto.

Marble chimney-pieces.

4518. To provide and fix in the offices, in the board-room, and in the actuary's drawing-room, marble chimney-pieces of the several qualities shown and expressed on the several drawings.

Portland stone chimney-pieces.

4519. To provide and fix Portland stone jambs mantles and shelves, to all the other fire-places throughout the building, those to the kitchen-chimney to be of 2-in Portland stone, each 8 ins. wide, and those to the other chimneys to be of 1¼ in. Portland stone 6 ins. wide.

[redacted]

CHAPTER XLVII.

Hearths and labs.

4520. To put to each fire-place a hearth of 2½ in. rubbed Yorkshire stone; to put to the kitchen a chimney-slab of 2½-in. rubbed Yorkshire stone 2 ft. wide; and to put to all the other chimneys, of every kind throughout the building, chimney-slabs of 2-in. Portland stone, each 18 ins. wide and 15 ins. longer than the chimney-opening.

[illegible], &c.

4521. To cut and work to the masonry all requisite back-joints, rebates, fair-edges, grooves, and holes; to round off all corners where requisite; and to perform the other work and labour proper and usual in and about mason's work; and to complete the mason's work to the satisfaction of the architect.

[illegible] cramps, [illegible], &c.

4522. To provide and use to the mason's work all requisite cramps and plugs of copper, or of gun-metal (no cramps or plugs of iron being allowed to be used in any part of the work), and to run completely with lead all the cramps, and such of the plugs as can be run with lead.

All the stone decorations are to be jointed to the satisfaction of the architect, each stone thereof is to be secured to the brick-work by two cramps of copper or of gun-metal, weight 8 oz. at the least, fixed also to bond-stone where requisite, of 3-in. Yorkshire stone paving, carried up in the brick-work; the horizontal joints in the stone-work are to be all set with plates of 4 lb. milled-lead therein, and each horizontal joint is also to have therein two plugs of strong copper-wire; all the arch-joints are also to have plates of 4 lb. milled-lead therein.

Mortar.

4523. All the stone-work is to be set in the best stone-lime mortar.

Cleaning off and making complete.

4524. To clean off and render complete and perfect, the whole of the mason's work immediately prior to the rendering up of the whole building works and premises as complete.

Reparation.

4525. To examine at the end of three years from the time of the completion of the whole of the works of the premises, all the mason's work, and should it then be found that any of the stone-work is decayed blown or injured by frost, or is otherwise not weather-proof and hard, to remove all such imperfect stone-work whatever may be its situation, and to make good in a complete and workmanlike manner to the satisfaction of the architect by the requisite new materials of proper quality all such decays defects and imperfections; and in like manner to make good all the other works which may be injured by or in consequence of the reparation and amendment of such decays defects or imperfections.

SLATER. (See §§ 542—3.)

[illegible] slating.

4526. To cover all the sloping roofs and the sides of the two dormers with the very best strong dutchess slates, pointed on the inside thereof with good stone lime-mortar with sufficient hair therein.

Bond, &c.

4527. The whole of the slating is to be very securely fixed

to the horizontal iron rafters by being tied thereto by very strong copper wire, is to be lapped full 3 ins., and is to have proper regular and similar bond in every part thereof, particularly at the eaves and at the heading-courses thereof, instead of having as in the more usual mode slates laid lengthwise with slips of other kinds of slates between them.

Reparation.

4528. To repair, make good, and leave finally perfect, to the satisfaction of the architect, all the new slating and all the slating of the adjoining buildings, which may be damaged by or in consequence of the execution of the several intended works.

Slate panels.

4529. To provide and fix in all the rebates of the iron framework described in the smith's work, panels of sound and perfect slate not less than $\frac{3}{8}$-in. thick, wrought perfectly smooth with sawn edges, and set in glazier's putty so as to form an ornamental arched and paneled ceiling over the public offices, and to prepare the same properly for oil paint.

Slate skirting.

4530. To put to the whole of the building above the basement-story skirtings or plinths of the several heights shown by the drawings, composed of the best hard slate not less than $\frac{1}{2}$-in. thick, wrought perfectly smooth in front and on the edges thereof, backed upon brick-work, and securely fixed by sufficient strong screws; and to prepare properly the whole of the same for oil paint.

CARPENTER AND JOINER. (See §§ 337—40.)

New materials, &c. (See §§ 1029—30.)

Timber and deals. (See §§ 1031—2.)

4531. *The object being to reduce as much as possible the quantity of combustible materials, this building, though standing upon nearly* 3000 *superficial feet, is designed to require only eight loads of timber in its composition, and even that could be reduced to about one-third part of the quantity by pursuing the system of vaulting the apartments throughout and using only timber sufficient for nailing the flooring-boards to.*

Ironmongery.

4532. To provide and fix to the whole of the carpenter's work and joiner's work, all proper and necessary nails, spikes, screws, and other proper ironmongery, and also all requisite brass-work. All the ironmongery and brass-work are to be of the very best quality.

Sundries. *(Though little of these would be required, they are provided for contingencies.)*

4533. To provide and fix all requisite shores, struts, puncheons, oak-wedges, ties, cletes, beads, stops, fillets, backings, blocks, linings, casings, furrings, and rolls; to provide all moulds, rods, and patterns requisite for setting out and for executing all the various works; to fix all the iron-work; and to perform such rebating, grooving, tonguing, beading, scribing, chamfering, housing, jointing framing, dove-tailing, planing, and other work and labour as may be found requisite for the perfect performance of and the thorough completion of the whole building and its appertenances.

CHAPTER XLVII.

Centering.

4534. To provide, fix, case when so directed, and finally remove, centering and turning-pieces for all the vaultings, for all the gauged arches and rough arches, and for all the brick trimmers.

Basement flooring.

4535. To floor all the rooms on the basement-story, except the scullery, with 1¼-in. yellow deal, listed quite free from sap-wood, laid folding upon fir joists 4 ins. by 2 ins., and oak sleepers 4 ins. by 3 ins. not more than 4 feet apart.

Flooring of waiting-hall.

4536. To floor the depositors' waiting-hall with 1½-in. yellow deal, listed quite free from sap-wood, upon fir joists 5 ins. by 2 ins., and oak sleepers 5 ins. by 3 ins. not more than 4 feet apart.

Other flooring of ground-story and flooring of one-pair story.

4537. To floor the remainder of the unpaved parts of the ground-story, and all the unpaved parts of the one-pair story, with 1¼-in. yellow deal half-boards, listed quite free from sap-wood, and laid with straight-joints with fir joists upon the brick vaultings 2 ins. by 2 ins. and joists laid upon the iron girders (with a bearing of 5 ft. 8 ins.), scantling 5 ins. by 2 ins.

Flooring over the actuary's drawing room.

4538. To construct the flooring over the actuary's drawing-room, with girders 10 ins. by 6 ins. joists bridged upon and housed into the girders 7 ins. by 2¼ ins. trimmers and trimming-joists 7 ins. by 2¾ ins., boarded floor of inch yellow deal half-boards laid with straight-joints, and yellow deal furrings, in order to form the ceiling of the drawing-room into panels according to the drawings.

Other floorings.

4539. To floor all the remainder of the building with inch yellow deal half-boards listed quite free from sap-wood, and laid with straight joints upon fir joists 9 ins. by 2¼ ins., and trimmers and trimming-joists 9 ins. by 3 ins.

Ceiling-joists.

4540. To put under the roofing the requisite ceiling-joists of fir 3 ins. by 2 ins. each in one length, fixed firmly to the iron ties of the roofing.

Quartered-partitions. ***(These may be wholly omitted, and brick-walls may be substituted for them.)***

4541.

	Ins.	Ins.
Lower plates	4	by 3
Upper plates	4	— 3
Collar-plates above the doorways	4	— 3
Door-posts and angle-posts	3	— 4
Braces framed at bottom into the plates and at top into the posts	3	— 3
2 tiers of inter-ties to each story	3	— 1½

Deal framed partitions, with wrought-iron panels.

4542. To divide off from each other and inclose the offices and the depositors' waiting-hall by 2-in. deal partitions according to the drawings, with panels of wrought iron $\frac{1}{10}$ in. thick.

Angle-staves.

4543. To put to all the projecting angles of the internal brick-work proper rebated and beaded angle-staves.

Skirtings. ***(These may be omitted.)***

4544. To put to the slate-skirtings of the ground-story and one-pair story the several mouldings according to the drawings, fixed on proper ploughed grounds.

2-in. and 2½-in. doors with wrought-iron panels and fan-lights. (The fan-lights may be of cast-iron.)

4545. To put to all the external doorways of the building, and to the whole of the ground-story and one-pair story of the building, deal doors framed and finished according to the drawings, and with panels thereto of wrought-iron $\frac{1}{16}$ in. thick and hung each with a pair of 4-in. butt-hinges, and a best strong mortise-lock with plain strong brass furniture, and with other ironmongery in addition thereto value ten shillings, to each of the external doorways: and to put over the external doors 1½-in. deal beviled-bar fan-lights as shown by the drawings. The principal front external doors are to be 2½ ins. thick, and all the other doors are to be 2 ins. thick.

1¾-in. closet-doors with wrought-iron panels.

4546. To fit up all the closets with 1¾-in. four-panel doors, with panels of wrought-iron $\frac{1}{16}$ in. thick, and hung with 3-in. butt-hinges and 4-in. strong closet-locks, and furniture to correspond with the furniture of the other doors of the rooms or other places in which such closets may be situate; all the closet-doors are to be framed and finished also to correspond with the other doors of the rooms and other places in which the same may be situate.

Closets.

4547. To fit up and inclose the several closets and other parts of the house where requisite, with 1½-in. deal square-framed partitions and inclosures with panels of wrought iron $\frac{1}{16}$ in. thick.

To fit up the closets on the inside thereof, each with three tiers of inch deal shelves as wide as each such closet will admit of, except where otherwise shown by the plans, and fixed with the requisite bearers.

(*These shelves may be made of slate or of wrought-iron.*)

1¾-in. doors with wrought-iron panels.

4548. To put to all the remainder of the door-ways throughout the building 1¾-in. deal four-panel square-framed doors, with panels of wrought-iron $\frac{1}{16}$ in. thick, hung each with a pair of 3-in. butt-hinges and a best 7-in. iron rimmed lock with plain solid brass furniture.

Door-cases.

4549. To put to the several door-ways in the situations indicated by the drawings, fir proper door-cases 5 ins. by 4 ins. with a socket of 4 lb. milled-lead 6 ins. high round the foot of each door-post.

(*These may be omitted, and the doors may be fixed to blocks of stone in the manner described in* § 3693.)

Door-linings.

4550. To fit up all the door-ways of the building, except where otherwise shown by the drawings, with 1¼-in. framed, tongued, and rebated linings, those thereof more than 10 ins. wide to be paneled and finished to correspond with the respective doors hung therein, but each jamb and each soffit being framed in only one panel.

(*The jambs of the door-ways are shown to be finished as far as possible with stucco and wood angle-beads, and no wooden lintels whatever are used in the building.*)

Architraves, &c.

4551. To put to the doors above the basement-story throughout all the buildings, in the situations indicated by the drawings, inch yellow deal grooved grounds 4½ ins. wide, and moulded architraves according to the drawings; and to put all round on

both sides of all the other doors throughout the whole building, double-quirked angle-beads.

Windows. (Sashes of iron may be substituted for those of wood. See §§ 3046, 3505, 3719, 3951, 4302.)

4552. To fit up all the windows of the ground-story with 2-in. yellow deal beviled-bar sashes, double-hung with iron weights, brass axle-pulleys, large patent lines and patent spring fastenings, in deal cased-frames with oak sunk sills; and to fit up all the remainder of the windows throughout the intended building with 1½-in. beviled-bar sashes double-hung with iron weights, brass axle-pulleys, large patent lines, and patent spring fastenings in deal cased-frames with oak sunk sills.

Shutters, &c.

4553. To fit up all the windows of the basement-story with 1¼-in. deal square-framed folding shutters with panels of wrought-iron $\frac{1}{10}$ in. thick, and with rule-joints, hung with strong hinges, and 20-in. spring shutter-bars, and with double-quirked angle-beads round the same, and inch deal window-boards upon proper bearers.

4554. To put to the front window of the actuary's drawing-room, and to the window of the waiting-room 1¼-in. shutters two panels high, the panels thereof of wrought-iron $\frac{1}{10}$ in. thick, the fronts of the front shutters framed and moulded to correspond with the doors of the same rooms and all the remainder of the shutters framed square; all the shutters are to be hung in two heights with 24-in. strong spring shutter-bars: and with 1½-in. proper boxings sunk and finished with mouldings to correspond with those of the architraves round the doors, inch deal square-framed back-linings two panels high, 1¼-in. moulded one-panel backs elbows and soffits to correspond with the doors, beaded capping and elbow-caps, and all other requisite fittings complete.

(Bunnett and Corpe's patent wrought-iron revolving shutters may be substituted for these.)

4555. To fit up the windows of the offices with 1¼-in. sliding shutters framed square, each with three panels of wrought-iron $\frac{1}{10}$ in. thick, hung in deal cased-frames with lines, weights, and pulleys, the same as described for the sashes. To put to each of the same windows an 1¼-in. deal window-back framed in three panels and moulded to correspond with the doors, with beaded cappings thereto, hung with hinges; and to put to the shutters brass thumb-screws.

4556. To fit up all the remainder of the windows with inch deal double-quirked beads to receive stucco, and inch deal tongued and beaded window-boards upon proper bearers.

4557. *The advantages gained by the use of wrought-iron panels, are the diminution of the quantity of combustible material, the obtaining of panels of any width without glued joints in them, and from their thinness either the use of slighter frame-work or deeper panels.*

Jobbing-work.

4558. To perform to the whole of the building and works and to their appertenances, all such carpenter's work and joiner's work as may be requisite thereto in the nature of jobbing.

SMITH.

Chimney-bars.

4559. To provide for each of the fire-places a wrought-iron chimney-bar 2 ins. by ½ in., properly corked at the ends thereof.

Columns.

4560. To provide and fix in the situations shown by the plans, cast-iron columns with ornamental capitals, and cast-iron plates at top and bottom, as shown by the detail drawings.

Girders and frame-work for the office-ceiling.

4561. To provide and fix for the support of the flooring of the board-room and the ceiling of the office, cast-iron moulded girders, and cross-bearers, in the rebates of which the panels of slate are to be placed in order to form an ornamental arched and paneled ceiling; and to put at each intersection of the iron frame-work an ornamental flower of cast-iron modeled according to the drawings.

Ties to the groined vaults of the entrance-halls.

4562. To provide and fix concealedly in the archivolt-bands of the groined vaultings of the two entrance-halls, wrought-iron ties according to the drawings, in order to prevent the said vaultings from expanding.

Bond.

4563. To put round all the walls of the basement, three complete tiers of iron-bond; to put round all the walls of the ground-story, four complete tiers of iron-bond; and to put round all the walls from thence upwards, four other complete tiers of iron-bond.

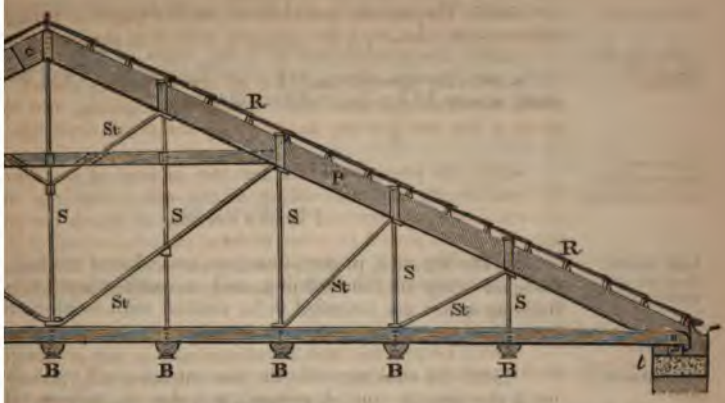
4564. All the iron-bond is to be wrought hoop-iron, 2 ins. by ⅛ in., and is to be carried throughout the brickwork in continuous chains, in the greatest possible unbroken lengths: all the angle-joints, and other joints therein, are to be firmly rivetted; and where apertures occur in the walls the bond is only to be cut out after the building has fully settled, and the ends of the bond are then to be turned down each one inch at the least.

Plates.

4565. To carry round in all the walls at the level of each floor above the basement story, and immediately under the roofing, wall-plates of wrought-iron scantling 2 ins. by ½ in. like the iron-bond also in continuous chains in the greatest possible unbroken lengths, without omission at the flues, and with the angle-joints and other joints therein firmly rivetted with holes punched, but not drilled therein, so that the full substance of the iron may remain undiminished.

Roofing.

4566. To provide, construct according to the drawings, fix over the whole of the building, and render complete, a fire-proof roof, consisting entirely of cast and wrought-iron, with rafters laid horizontally so as to avoid, thrust, and to serve as slate-battens; with trusses over the principal central mass of the building, laid so as that the centre of one truss shall not be more than 6 ft. from the centre of the next truss, and with the other trusses and other work formed according to the working detail drawings, and the directions thereon written.



Principals of cast-iron, with ledges cast thereon, to receive the rafters, and forked and bolted t the ridge.
Tie of wrought-iron bolted to the feet of the principals, and clasped round the wrought-iron

llar of iron, either cast or wrought, tenoned into the principals.
spenders of wrought-iron passed through the bosses cast on the principals and collar, and e ties and struts: if it be preferred, the suspenders may be made double as slings to pass e principals ties struts and collar.
ruts of flat wrought-iron, with beviled ends through which the suspenders are to pass, and through them where the three central suspenders pass through them.
afters of wrought-iron, laid horizontally, at such distances as that the centre of one rafter xactly 10½ ins. from the centre of the next rafter, and so as also to act as slate-battens. ers may perhaps be fixed most readily by being dove-tailed, and wedged by copper wedges

airs of ledges cast on the principals thus:—
nders of cast-iron, moulded, rebated with ledges the slate paneling, which is to form the ceiling, up by the suspenders S. being passed through h an ornamental flower or boss of cast-iron or of other material, forming a large washer either to r heads of the suspenders, as may be deemed e binders may be disposed so as to form a hand- ed and paneled ceiling, without the use of wood- plastering. The mouldings of the binders may be nrichments upon them.
ll-plate of wrought-iron.

nplet of granite curb under each of the ends of the trusses.
rt of the substance of the iron is to be reduced by the punching or holes.

4567. To provide and fix all round the front area neat iron ornamental palisading according to the drawings.

&c. 4568. To put to the basement stair-case, and to the minor upper stair-case, wrought-iron turned ornamental newels 1¼ in. diameter, wrought-iron balusters ¾-in. square, tenoned and run with lead into the stone-work after the rate of two balusters to each step; and wrought-iron rounded hand-rails 1½ in. by ½ in., rivetted to the balusters and newels, and firmly secured at the attached ends thereof.

4569. To fit up the principal stair-case with ornamental wrought-iron newels, and ornamental cast and wrought-iron balusters according to the drawings, tenoned and run with lead into the

stone-work, and wrought-iron rounded hand-rail 2 ins. by ½ in., rivetted to the balusters, and firmly secured to the party-wall.

3 cwt. ties, &c. (See § 1703.)

4570. To provide and fix 3 cwt. extra of iron in such ties, bolts, nuts, screws, straps, and other light wrought and hammered work as may be by the architect directed.

PLASTERER.

Lath, plaster, float, set, and whiten ceilings.

4571. To lath, plaster, float, set, and whiten ceilings to the two-pair story of the building, and to such other parts of the building as are not intended to be vaulted with brick-work, or to have slate paneling.

Vaulted ceilings.

4572. To execute with the best stucco-work upon the brick-work the several vaulted, groined, and domed ceilings with their bands and other works and finishings, as shown by the drawings; and to colour the same stone-colour when dry. The vaultings of the basement stair-case, basement-passage, and scullery are not intended to be plastered.

Troweled stucco.

4573. To execute in the very best floated and troweled stucco, lathed where requisite, all the sides and internal brick-work from the ground-floor upwards.

Render float and set.

4574. To render, float, and set all the remainder of the internal brick-work of the building, except the sides of the scullery and of the basement stair-case and basement passage.

Reveals, &c.

4575. To execute in gauged-stuff the several reveals, margins, and beads, which may be requisite to the sky-lights, arches, and other parts of the building.

Cornices, &c.

4576. To execute round the several rooms and other parts of the one-pair story and in the other situations where so shown, plaster cornices, mouldings, and enrichments, according to the drawings; and to teint the same stone-colour when dry.

Parker's cement skirtings.

4577. To run round all the plastered parts of the basement-story, skirtings of the best Parker's cement, 9 ins. high, teinted stone-colour.

Laths.

4578. The whole of the lathing is to be done with strong heart of fir laths, and no laths with any sap-wood therein are to be used in any part of the work.

Quirks, &c.

4579. To execute to the plasterer's work all proper and requisite quirks, beads, and arrises; to form and execute all necessary and proper additional thicknesses; and to provide and drive into the work such cast-iron nails as may be requisite for holding properly the plastering.

CHAPTER XLVII.

PLUMBER.

6½-lb. milled-lead to flats, gutters, and valleys.

4580. To lay the flats, gutter-boards, and valleys with the best milled-lead, weight full 6½ lbs. to the foot superficial, turned up full 6 ins. against all brick-work and other perpendicular sides, and full 10 ins. high against all the sloping sides of the roofing, and the lead to the valleys is to be full 20 ins. wide.

Dormers.

4581. To cover the tops of the two dormers with 5 lb. milled-lead, and to put round the dormers flashings of 5 lb. milled-lead 15 ins. average width, all the lead-work of the dormers being very securely fixed.

5-lb. milled-lead flashings.

4582. To put flashings of 5 lb. milled-lead 5 ins. wide, round all the edges and ends of the leaded gutters and flats.

5-lb. milled-lead step-flashings.

4583. To put to all the roofing where the same gables or rakes against any brick-work, flashings of 5 lb. milled-lead 12 ins. average width set step-wise into the brick-work, and dressed down properly over the slating.

5-lb. milled-lead to hips and ridges.

4584. To cover all the hips and ridges with 5 lb. milled-lead 18 ins. wide, effectually secured.

5-lb. milled-lead chimney-aprons.

4585. To put to the chimneys in addition to the flashings above described, such aprons of 5 lb. milled-lead as may be required for rendering the roofing secure and complete.

Eaves'-guttering.

4586. To put all round the projecting eaves of the rear parts of the building 4-in. semi-circular cast-iron eaves'-guttering, fixed on sufficient strong wrought-iron brackets, and put together with white-lead.

Front Cornice-gutter.

4587. To provide and fix upon the ornamental stone blocks of the cornice of the principal front an ornamental cast-iron gutter forming the corona and cyma-recta of the said cornice, made in the most exact manner, with proper falls, and jointed so as not to emit water.

Rain-water-pipes.

4588. To put from the guttering to the areas, stacks of cast-iron rain-water-pipes in the situations and of the several capacities described on the roof-plans, and with shoes and neat heads of approved pattern, and fixed complete.

Water-closets.

4589. To fit up the two water-closets with Findon's very best water-closet apparatus, with blue basins, traps, 5-in. soil-pipes of 10 lb. lead, ¾-in. service-pipes, and all other requisite fittings, work, and appertenances of the most complete description, fixed under the direction of, and to the satisfaction of Mr. Findon, the patentee.

Sinks, &c.

4590. To put from the sinks to the drains 2-in. strong lead waste-pipes with brass bell grates.

1 cwt. extra lead-work.

4591. To provide under the contract for the work 1 cwt. extra of milled-lead, including labour and all proper materials to be used in such additional works as the architect may direct,

deduction however is to be made for the same if not used, after the rate of per cwt., including the labour and all materials requisite in fixing the same; and all additional lead-work is to be taken at the like price of per cwt., including the labour and all materials requisite in fixing such additional lead-work.

Copper nails.

4592. All the nails to be used in the plumber's work are to be of copper.

PAINTER.

Preparation.

4593. To knot with silver leaf, stop, pumice, smooth in every part, and prepare properly in the most perfect manner, all the wood-work and other works intended to be painted. To scrape and burn quite free from rust all the iron-work.

Four times in oil.

4594. To paint four times with the best oil-colour all the internal and external wood-works, slate-works, and iron-works, all the internal stucco, and all the other works, where all the said works are usually painted, the first two coats of colour to the iron-work being done with red-lead paint.

Flatting.

4595. To flat extra of such teints of stone-colour as may be by the architect directed, the whole of the internal stucco-work and slate-work of the building, and all the wood-work of the stair-cases, passages, and lobbies, and all the wood-work and iron-work of the one-pair story.

General colours.

4596. The sashes are to be finished on the outside thereof, with dark purple-brown; the other plain painting is to be in general finished of such teints of stone-colour, drab, brown, or other plain colours, as may be by the architect directed.

GLAZIER.

Second glass.

4597. To glaze all the windows and lights of the basement-story with good clear second Newcastle crown glass.

Best glass.

4598. To glaze all the remainder of the windows, sashed doors, sky-lights, and other lights, with the very best clear Newcastle crown glass.

4599. The whole of the glazing is to be properly bedded, bradded, and back-puttied, and is to be cleaned and left perfect at the final rendering up of the works as complete.

CHAPTER XLVIII.

Specification *for a* Portico.

BRICKLAYER.

4600. *(If the portico be an addition to a fabric previously existing, a clause for ground-work, digging, and cartage will be required, but if the portico form only part of an intended new building, no such separate clause will be required. See Index.)*

4601. *(If it be deemed judicious to form an artificial foundation beneath the brick-work under the portico, a clause to that effect may be inserted, for which see Index.)*

4602. To construct for the portico a foundation of brick-work according to the drawings, with continuous footings, consisting of two courses of brickwork ft. ins. thick, two courses of footings of brick-work ft. ins. thick, and two courses of footings of brick-work ft. ins. thick; and to carry up the foundation-wall of the portico from thence upwards in height ft. in., and ft. ins. in thickness. *(In order to save brickwork and to lessen the weight of materials upon the soil, intervals between column and column may be left in the foundation-wall, but very great care must then be taken to prevent the different pieces of the foundation from either twisting awry, or otherwise rendering the superincumbent masonry liable to be displaced; and to this end, the apertures between pier and pier must have arches at top and counter-arches at bottom. A portico should not on any account be built upon detached piers, but under all circumstances the footings should be continued all round the portico; the arches should be semicircular, for by a settlement of the work segmental arches may thrust out from their places the bases of the angle-columns, and thus ruin the whole portico; indeed effectually to prevent the occurrence of such a defect, sometimes a chain or tie of timber is placed in the foundation, but this is by no means advisable, as the preponderance of experience proves that timber in such a situation rots; perhaps if it were entirely covered over, ends and all, with a pitchy composition, it might last; yet would the experienced practitioner place no timber in such a situation; a very strong bar of wrought-iron, in one piece, and well pitched all over while hot, would form a much better tie in such a situation; a bar of cast-iron would break if it suffered the downward cross strain of a very inconsiderable settlement of the work at the foundation.)*

4603. *(There must be brick foundations for the support of the paving and steps of the portico, according to the nature of the soil, the number of the steps, and the length weight and nature of the stones; and sometimes the whole of the platform under the portico is supported by vaulting.)*

4604. *(If the portico is to form only part of an intended new building, the nature of the bricks, mortar, &c., will not require to be specially described, but if the portico be merely an addition to a building*

already erected, these particulars should be stated, for which see §§ 1008—10. *)*

4605. *(Some architects would prefer that the whole of the foundation brick-work should be laid in Parker's cement; if this mode be adopted, insert a proper clause, for which see Index, but it is much to be doubted whether the great extra expense which is incurred by the use of Parker's cement in such a situation, is met by any commensurate advantage: foundations and arches so built, fracture by the least sinking of the soil, and when once fractured never re-unite: whereas, work set in lime-mortar, if in a damp situation, will re-unite after fracture; in general vaults domes and arches, are much better, and remain freer from fracture, if set in lime-mortar than if set in Parker's cement, which quickly becomes hard; for scarcely will any vault, dome, or arch, remain precisely in all its component parts exactly in the position in which it is placed upon the centering; the centering must be slightly eased and detached from the work immediately that the vault, dome, or arch is turned, but if the cement or mortar have previously set hard, the work in bringing itself to a state of rest will find vent somewhere, though previously hardened into one piece; whereas, if built in lime-mortar, which can be kept soft, the work will gradually squeeze itself into a state of rest without the least fracture or irregular settlement: inattention to this subject by imperfectly informed theorists has often led to great failure, and large extra expenditure.)*

Discharging-arches, &c. above the architrave.

4606. To turn above the architrave from column to column, and from the lateral columns to the main wall of the principal building, arches in brick-work according to the working-drawings, in order to discharge the pendent parts of the architrave from all the superincumbent weight.

4607. *(There must be no core left between the architrave and the soffits of the arches, but the space must be left open so that the pendent parts of the architrave may not have to support any weight beyond their own, and indeed such cores would wholly destroy the discharging effect of the arches.)*

4608. To fill in with brick-work the spandrils between the discharging-arches, and to raise and back up the brick-work behind the stone tympanum quite up to the under-side of the raking cornice of the pediment.

4609. *If the portico be large, it will be worth while in order to lighten the weight of the pediment, to leave in the brick-work supporting the raking cornice a series of circular recesses or bulls'-eyes severally as large as the triangular shape of the tympanum will allow.*

MASON. (See §§ 265—95.)

4-in. Yorkshire stone under the foundation. ***(If the portico be very small and the soil be good, this may be omitted, or the stone may be thinner; or if the portico be very***

4610. To provide and bed in stone-lime mortar, all round beneath the continuous footings of the brick-work below the portico, two complete layers of the best hard and well compacted Yorkshire stone landings, each layer of the stone ft. ins. wide, and not less than 4 ins. thick in any part thereof; the stones of

oil the upper layer are to be bonded and crossed and lapped upon the
,r lower layer as much as possible; the stones are to contain each upon an average 25 ft. superficial, and no stone is to contain less
ers than 15 ft. superficial.

4611. To provide, work, fix, and execute, the columns *(state the number)* of the portico according to the working-drawings, with bases shafts and capitals all entirely of the best Portland stone (or of such other description of stone as may be intended.)

4612. *(If the architect be careful as to the sizes of the different stones to be used in the intended work, he will have the positions of all the joints in the columns, pilasters, and other parts of the portico, accurately shown in his working-drawings; and if the columns and pilasters be not large, and the nature of the stone so admit, he will require the shafts of them to be made each in one piece of stone: blocks of Portland stone which exceed 6 ft. or 7 ft. in length are however apt to be shelly at their ends, and though generally hard, become porous at such parts.)*

4613. To provide, work, fix, and execute to the portico *(state the number)* pilasters according to the working-drawings, with bases shafts and capitals, entirely of the best Portland stone *(or of such other description of stone as may be intended.)*

4614. *(The horizontal joints in the pilasters should agree with some of the horizontal joints in the adjoining brick-work and ashlaring, and each alternate block of the pilasters should be at least 4 ins. thicker than the rest of the blocks, in order that the stone-work of the pilasters may be bonded properly into the brick-work.*

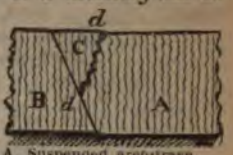
There is in modern practice a most reprehensible abuse of merely paving the front of a building with pilasters 2 or 3 ins. thick, instead of bonding and tailing them into the solid brick-work.)

4615. To provide, work, fix, and execute, entirely of the best Portland stone *(or of such other description of stone as may be intended)* the architrave all round over the columns of the portico, according to the plan and other working-drawings, with joggled-joints wrought out of the solid stone *(the scantling of the stone and the length of each piece of stone may be stated.)*

4616. *(If the portico be small, and the columns be very far apart, the whole height of the architrave and of the frieze above it, should be wrought together out of one stone, otherwise the architrave may from weakness give way; and in that case the joints in the work can be placed over the columns without the expense and labour of joggled joints.*

4617. *But if the portico be of very large dimensions, it will sometimes be necessary to join the stones of the architrave in the thickness or breadth of the soffit, as at the Post Office, London; and it is even sometimes necessary, for the same reason, to make the crown-members of the architrave of a different layer of stone, in which case the stones composing the crown-members*

need not be carried far back; thus some stone may be saved: but in this case the vertical joints of them ought to be placed over the vertical joints in the large blocks of the architrave, so as to appear one with the larger blocks; otherwise the masonry will have a very mean appearance. It is necessary that the architrave shall always be of a hard kind of stone: at the new palace at Pimlico, some of the lower architraves are broken, although their arch-joints, in order to make up for the little tenacity of Bath-stone, are exposed instead of being reduced in strength by making them concealed as ordinary joggle-joints.



A. Suspended architrave.
B. Stone over a column.
C. Arch-joint.
d—d. Fracture.

Chain-bar.

4618. To provide and let flush into the solid stone, all round the top of the architrave, a chain-bar entirely of copper scantling ins. by ins., so cast with projections or stubs on the under-side of it, that two projections or stubs may be let into every stone composing the architrave.

4619. *(Note; the chain-bar should be continued also all round the back of the portico, so as to form a complete circuit; and it is common to carry the ends of the lateral pieces of the chain-bar quite through the main wall of the building, and to secure them by nuts and plates on the inner side of the wall; if the portico be large, it will be well also to strengthen the angles of the chain-bar, by diagonal pieces of copper as long as can be without appearing within the portico; also if the architrave be very wide, it will be well to make use of two chain-bars side by side at a considerable distance apart.*

4620. *It is usual to make the chain-bars of porticos of wrought-iron, and in short pieces, with their ends merely turned down into wrought-iron collars inserted in the stonework.*

4621. *But the rending and stains caused to the stone by the corrosion of wrought-iron has induced some persons unwisely to omit chains in such a situation; unwisely, because if the slightest settlement occur in the portico, and even if only the small horizontal stone-rests in the joggle-joints of the architrave break away, the wedging nature of the joggle-joints will come into immediate operation, and will cause the architrave to spread, and thereby allow the pendent blocks of it to drop.*

4622. *There should on no account be any joins whatever in a chain-bar except at the angles of the portico; for the more the joins, the greater will be the liability of the chain to stretch and become ineffective.)*

Return architraves.

4623. To provide, work, fix, and execute of the best Portland stone *(or of such other description of stone as may be intended)* the architrave at the back or inside of the portico, in all respects in external appearance the same as the detached architrave of the portico, but only of the thickness shown by the drawings. *(The scantlings and size of the stone may be stated.)*

4624. *(If there be any return architraves or stone beams in the soffit of the portico, a description of them should be here inserted.)*

rieze. 4625. To provide, work, fix, and execute, an entire frieze to the whole three sides of the portico, according to the working-drawings, and consisting of the best Portland stone 4 ins. thick (or 5 ins. or 6 ins. or more in thickness, as the case may require), (or of such other description of stone as may be intended). The stones forming the quoins of the frieze are to be cut from solid stone so as to show in their returns a width of ft. ins. at the least.

4626. *(In general, friezes need be of no great thickness, as they merely form a screen-work ; and it is best where porticos are large and heavy, to allow all possible space for the concealed brick arches which should be turned above the architrave from column to column in order to support the weight of the cornice and pediment (if any), and thus to preserve the pendent parts of the architrave from being fractured.*

4627. *If the portico be of the Doric order, the triglyphs will require an additional thickness of stone, and the metopes or spaces between the triglyphs should be slightly dove-tailed at their sides into the latter.)*

rnice. 4628. To provide, work, fix, and execute the cornice to the whole three sides of the portico, and to the pediment thereof *(if any)* according to the working-drawings, and consisting entirely of the best solid Portland stone *(or of such other description of stone as may be intended).*

4629. *If the cornice be small, it will be made in one layer or bed of stone, but if large it must be in several of them, the particular scantlings of which may be stated : all the intended joints in the cornice should be distinctly marked in the working-drawings by blue lines, and no joints should run through modillions, blocks, or mutules.*

mpanum. 4630. *(If the portico have a pediment, the tympanum of it will require to be cased with stone-ashlaring, or with sculpture ; for stone-ashlaring, see the Index : the stone-ashlaring will appear more like solid masonry, if laid in courses of moderate height, instead of with thin stones running all in one piece from the level cornice up to the soffit of the raking cornice, which method makes the tympanum appear as if it were paved rather than formed of solid masonry.)*

4631. *In laying the raking cornice upon the tympanum, it will be well to cut out the hidden soffit of the raking cornice in a series of small concealed steps, in such manner as that the cornice may along its whole length be seated upon the brick-work behind the tympanum in an ascending series of horizontal planes, and thus have no inclination to remove from its otherwise inclined position.*

4632. *The apex of the pediment with a portion of the cornice on each side of it should be formed of one large stone having an horizontal bed with a portion* mum

attached to it; and the ends of the raking cornice at the lower angles of the pediment, should be wrought each out of the same stone as the angles of the level cornice below them.

Blockings, acroteria.

4633. *(If the portico be surmounted by any blocks, pedestals, or acroteria, a particular description of them may be inserted.)*

Door-way.

4634. To construct and fix the architrave, frieze, cornice, and carved trusses of the doorway under the portico according to the working-drawings, entirely of the best Portland stone *(or of such other description of stone as may be intended)*.

(For a more particular description of doorways see the Index.)

Back of the portico.

4635. *(If the back of the portico be cased with stone, a clause to that effect may be inserted, for which see the Index.)*

Internal plinth and base mouldings.

4636. To provide and fix round the back of the portico, base-mouldings according to the working-drawings, wrought out of solid Portland stone of scantling by *(or of such other description of stone as may be intended)*.

String courses, &c.

4637. *(If there be any string-course or other ornaments at the back of the portico, a particular description thereof must be inserted.)*

Steps.

4638. To provide and fix all round the portico *(state the number)* steps of solid Portland stone *(or Craig-leith stone, granite from Aberdeen, Guernsey, or elsewhere, as the case may be; steps of Yorkshire stone are too mean to be used with propriety in such a work)* scantling 13 ins. by 6 ins. properly back-jointed and worked all over *(the steps should under no circumstances be less than 12 ins. by 6 ins. and they may sometimes be 15 ins. wide including the width which they lap one over another: the upper step is frequently wider; and sometimes there is placed under each column a large square block of stone which unites with the upper step and appears to form part of it.*

Landing.

4639. To form to the whole of the portico a complete landing of Portland stone *(or granite or other stone, as the case may be)* not less than 4 ins. thick, and in slabs and with joints only as shown by the working-drawings; all the joints of the steps and landings are to be joggled and run with lead.

4640. *If the portico be small or mean, it may have paving of thinner stone, or the paving may be of rubbed Yorkshire stone.*

Soffit and covering of the portico.

4641. *The soffit and internal cornices and mouldings of a portico and the exterior covering of a pediment both for beauty and for duration ought to be of stone; but as in most modern porticos, all interior columns are omitted, the ceilings and roofs of them are almost of necessity supported by timber and cannot very easily be constructed otherwise except in very small porticos. The porticos of St. Paul's cathedral are arched with solid stone, and in this respect, whatever their other demerits, they far outstrip in excellence most ancient porticos: these would refuse an infamous immortality to such incendiaries as those who burnt the roofs of the temple of Ephesus and*

York minster: such vaulting would have saved the famed basilica of St. Paul, at Rome, which, though principally of masonry, had almost every column of it destroyed by the burning of its timber; but perhaps the Royal Exchange, London, showed the strongest effects of combustion, for fire seemed to have played a game of skittles, and to have overthrown in a night all those columns which had stood erect more than a century and a half.

rving. 4642. To execute all the ornaments, carving, and enrichments of the capitals of the columns and pilasters, those of the soffits and mouldings of the architraves, those of the frieze, and those of the mouldings, dentils, soffit, and modillions of the cornice; the whole of the ornaments, carvings, and enrichments are to be done in the very best style, with spirit, boldness, and precision, and without blemish, after models of the full size of the intended work, which the contractor is to have made at his own expense from the working-drawings to the satisfaction of the architect.

uting *(if any)*. 4643. To work to the whole of the columns, flutings with proper stops or heads and feet at top and bottom according to the drawings, and with the whole surface of the flutings and of the fillets (*or arrises, as the case may be*) between them rubbed perfectly smooth.

ad, cramps, &c. 4644. All the different blocks of stone composing the bases, shafts, and capitals of the columns, are to be set upon each other in the work within each horizontal joint thereof a sheet of milled-lead, weight 6 lbs. to the foot superficial, and of the full size of the bed of the stone, except that the lead is all round not to extend to within $\frac{1}{2}$ in. of the outer surface of the work: the stones of the architrave are in like manner to have 6 lb. milled sheet-lead between them and the capitals of the columns and pilasters, and each piece of the stone frieze is also to have under it two pieces of 6 lb. milled-lead each 4 ins. square.

4645. *If the portico be very small, the sheet lead needs not weigh more than 4 lbs. to the foot superficial; but if the portico be very large the lead may be increased to 8 lbs. weight to the foot superficial.*

4646. To put in each horizontal joint of the columns, and to each joint between the columns and the architrave, three plugs of copper each one inch square and two inches long; each plug let in very exactly and set at both ends thereof in Parker's cement. To provide sufficient metal, and run with lead the joggled joints and chain-bar of the architrave; to channel and run with lead, so as to be water-proof, the joints in the cornice, and in all the other work subject to receive rain; to provide for all the joints in the stone-work and for uniting the stone to the brick-work all requisite cramps of copper (or of gun-metal), and to let in, fix and run the same with lead. (*When the drawings are made the cramps which will be requisite will be seen, and a more particular account of them can then be given. See* § 4522.)

4647. *The method of setting the blocks of stone columns upon sheets of lead, is not wholly a modern practice: Des*

Godetz in his description of the Temple of Concord, at Rome, mentions an instance of the same careful precaution observed in that building. "Entre les joints des bazes & des chapiteux "avec les colonnes il y a des tables de plomb."

4648. To point with good mortar all the external parts of the columns, and wherever else may be requisite in and about the mason's work.

CARPENTER.

(See §§ 1029—1033.)

Materials, &c.

4649. To provide and fix *(state the number)* fir *(or oak as may be intended)* framed trusses, according to the drawings, for supporting the roof of the portico with timbers of the following scantling *(according to the size of the portico.)*

Trusses.

		Ins.	Ins.
No.	tie-beams	—	by —
	principal rafters		
	queen-posts (if any)		
	king-posts (if any)		
	collar-beams (if there be queen-posts) ...		
	straining sills (if there be queen-posts) ...		
	struts		

Wall-plate.

4650. To put all round the four sides of the portico below the timber trusses an oak plate 6 ins. by 6 ins. properly framed together at the angles thereof.

4651. *(If the wall-plate be laid over the stone-work, sheet-lead should be laid all along under the plate, to prevent any humidity from the stone from rotting the wood.)*

Purlins.

4652. To put over the trusses *(state the number)* purlins of fir *(or oak as the case may be)* scantling — ins. by — ins., with a block 16 ins. long, and scantling — ins. by — ins. put upon each principal rafter to support each purlin.

(It will be well to make all the rafters as small horizontal purlins, by which means they will tie in the pediment, and cause no thrust. See §§ 513—5.)

Covering.

4653. To roof in and cover the whole of the portico with inch yellow deal boarding *(or oak planking as the case may be)* listed quite free from sap-wood, and laid upon rafters of fir *(or oak as the case may be)* scantling 5 ins. by 2¼ ins., with a ridge of fir *(or oak as the case may be)* 9 ins. by 1¼ in.

Ceiling.

4654. To construct a naked ceiling-floor to the whole of the portico according to the drawings, with binders — ins. by. — ins. and ceiling-joists spiked in one length below the binders 3½ ins. by 2¼ ins.

4655. *If the ceiling of the portico is to be paneled or coffered, and is to have the appearance of beams crossing it, the*

binders will have to be placed in pairs, and the whole of the ceiling with the binders and the tie-beams, will require to have strong cradling formed of yellow deal, to receive the plastering: of this timber framing and of the cradling attached to it, a very exact drawing should be made for the workmen, otherwise the plastering will not finish as intended; and great care must be taken that the whole of the ceiling of the portico shall camber, or rise upwardly in a considerable degree, in order to counteract the bad and ruinous appearance which a decorated ceiling has after the timber-work of it has settled down to its permanent position, if set at first exactly horizontal; for if a ceiling drop ever so little below the horizontal line, the defect appears great, and even if it remain exactly horizontal, it will still appear to sag or bend down in the centre, and afterwards the continuance of settlement, which always occurs, will make it appear to sag still more; a ceiling to a portico, sinking or cracked by the shrinkage of timber, has always a very mean appearance.

4656. To lay the gutters of the portico with 1¼ in. yellow deal boards, listed free from sap-wood, with current not less than 1½ in. to every 10 feet, and with 2½-in. drips (*if any be requisite*) upon bearers of 1½-in. yellow deal securely fixed.

PLASTERER.

4657. To execute to the whole of the portico, a ceiling with the beams, paneled-work, mouldings, enrichments, and decorations, according to the drawings, and consisting of the very best Dorking stone-lime stucco, floated upon strong English heart of oak laths fixed with strong copper nails.

4658. To teint in imitation of the colour of the stone-work of the portico, the whole of the plasterer's work of the ceiling and of its appertenances.

4659. *Sometimes the ceiling of a portico has a finishing of oil mastic over the lime plaster, but little faith can be placed in the duration of this: oil mastic receives workmanship perhaps more beautifully than any other description of plaster, but a few years prove that the bleaching process proceeds till all the oil has left the substance of the work, and it returns to its original detached particles, and the process of extracting the oil also goes forward on the inside of it next the brick-work.*

4660. *Before the author observed this to be the case, he preferred oil-mastic to all other descriptions of stucco.*

PLUMBER.

4661. To lay the roof (*or flat as the case may be*) of the portico with cast-lead weight full 8 lbs. to the foot superficial, with rolled joints not more than 2 ft. 3 ins. apart (*if the rolls of the lead-work are intended to combine with and to suit any ornaments of the portico, the widths of the sheets of lead must be made accordingly*)

the lead-work is to extend — ins. over the cornice of the pediment.

4662. *If the roof be flat, the lead should turn up 6 ins. all round against the brick-work or stone-work.*

Gutters.

4663. To lay the gutters of the portico with 8 lb. cast-lead turned up 6 ins. next the brick-work and stone-work, and — ins. next the rafters. (*The necessary extent of the lead this way will vary according to the inclination of the pediment: the lead must turn up the more as the roof is the flatter.*)

Flashings.

4664. To put over the edges of the gutters (*and flat if any*) flashings of 6 lb. milled-lead 7 ins. wide burnt into the stone-work.

R. W. P.

4665. If the water from the roof of the portico cannot conveniently be discharged in any other manner, a separate pipe (or two or more pipes) must be carried from the roof of the portico itself; such pipes should be made of lead weight 8 or 10 lbs. to the foot superficial, and sometimes, if they would otherwise have an ill effect, they are made square, are let flush into the wall, and are painted stone colour. Iron pipes should never be applied against stone buildings, as they rust and stain the work, and have a mean appearance: moreover iron pipes, if cemented together, often burst from oxidation.

CHAPTER XLIX.

Specification for stone dressings to windows and doors of Classical Architecture.

(If the description be intended for a window the proper word must be used accordingly.)

Sill or step.

4666. To put to the door (*or window as the case may be*) a step (*or sill*) of one single piece of the best solid Portland stone (*or other description of stone, as the case may be*) scantling — ft. — ins. by — ft. — ins. worked according to the drawings, and embedded at each end thereof upon a piece of 6 lb. milled-lead, and left so as to hang freely in the centre thereof without touching the work beneath.

4667. *(The sill if for a window must be throated, and if there be any peculiarity of workmanship upon it, it should be stated, and reference should be made to the drawings.)*

Architrave.

4668. To construct the architrave round the (doorway) of the best solid Portland stone (*or of granite or other stone, as the case may be*) scantling — ft. — ins. by — ft. — ins. The lintel thereof is to be in one piece of stone, and the jambs are to be each in one piece of stone; the whole of the architrave is to be back-rebated as shown by the drawings, and is to have in each

horizontal joint thereof two copper plugs, each ½ in. square and 2 ins. long.

4669. *(If the doorway or window be very large, the jambs of the architrave must be in several pieces; in this case it will be better to cut the pieces of stone of no very great length in proportion to their bulk, and to make each alternate stone wider on the face than the others, so that the stone shall bond into the wall to which it is adjoined: but if the architrave be set in brick-work, this extra width must be worked away in front, sufficiently deep to admit of the brick facing extending quite up to the mouldings of the architrave, in order to avoid the uncouth appearance which the work would otherwise have.*

4670. *If the work be of importance, it will be much the best to adopt a fine granite architrave, on account of the length of duration and strength of that description of material.*

4671. *Note also, that the work will appear more neat, when the architrave is set in brick-work, if the outer edge of the architrave be rebated away behind the moulding about half an inch, in order to conceal the perpendicular joint between the brick-work and the stone-work.*

Frieze *(if any).* 4672. To put over the architrave of the (doorway) a frieze of one single piece of Portland stone (*or other stone as the case may be*) in height — ft. — ins., and in thickness 6 ins. (*or of such other thickness as the case may require*) set upon two pieces of 6 lb. milled-lead each 6 ins. square, so as to let the centre of the stone hang freely, and thereby not be subject to fracture by settlement of the building.

Cornice *(if any).* 4673. To provide, work, fix, and execute according to the working-drawings, the cornice over the doorway of one single piece (*unless impossible from the length of it*) of the best Portland stone (*or other stone as the case may be*) scantling — ft. — ins. by — ft. — ins.

4674. The cornice is to be tailed into the wall in such manner as that no weight whatever may be cast either upon the frieze or the lintel of the architrave, except at the ends of it over the jambs.

4675. *(Behind the brick or stone facing above the doorway, there should be a strong concealed arch, in order to relieve the architrave lintel frieze and cornice from all the superincumbent weight of the wall; if this be not the case, the stone-work, however thick or however strong in nature or substance, will assuredly sooner or later break with the weight, or with the least settlement of the building.)*

Consoles *(if any.)* 4676. To provide and fix at the sides of the (doorway) a pair of consoles of Portland stone (*or other stone as the case may be*) carved according to the working-drawings.

Enrichments. 4677. *(If the architrave, frieze, or cornice, have any enrichments, a clause to that effect must be inserted, for which see* § 4642.)

CHAPTER L.

SPECIFICATION *for an* ARCHIVOLT OF STONE *to an Aperture.*

4678. To construct according to the working-drawings, the archivolt of the best Portland stone (*or of such other description of stone as may be intended*) of clear scantling when worked ft. ins. by ft. ins. with joints only in the situations shown by the blue lines upon the drawings, and with a plate of 6 lb. milled-lead in every joint (the lower joints or beds included), each plate of lead being of the whole superficial size of the section of the archivolt, except that all round it is not to extend within one inch of the outer edges of the stone-work, and all the open parts of the jambs are to be pointed with mortar immediately before the work is finished.

4679. (*If the archivolt have any carved-work upon it, a proper clause to that effect must be inserted either here or among the general directions for carving ornaments and enrichments. See* § 4642.)

CHAPTER LI.

SPECIFICATION *for a* PALLADIAN WINDOW *or for a* DOOR OR WINDOW WITH ATTACHED COLUMNS OR PILASTERS. (See §§ 4498. 4506.)

Sill or step. (See § 4666.)

Attached columns or pilasters. 4680. To construct of the best solid Portland stone (*or of such other description of stone as may be intended*) the side attached columns (*or pilasters, as the case may be,*) according to the working-drawings (*the scantling of the stone should be stated, and if the work be large, the stones may be alternately bonded into the brick-work, as described at* § 4614.)

Detached columns or pilasters. 4681. To provide, work, fix, and execute of the best Portland-stone (*or other stone, as the case may be,*) according to the drawings, two isolated columns (*or square pilasters, as the case may be*) with their bases, shafts, and capitals each in one single stone. (*It seldom happens that the columns in Palladian windows are so large as to require their shafts to be made of several pieces of stone.*)

4682. To construct and fix according to the working-drawings the entablature over the columns and pilasters (*if any*) of the

window, of solid Portland stone (*or of such other stone as may be intended*) wrought with internal and external mouldings and faces.

chivolt. (For this see §§ 4678 and 4498.)

Sometimes Palladian windows have larger external arches spanning from one extreme pilaster or column to the other: this, when well managed, renders the windows very handsome, and is excellent in construction, as the detached columns or pilasters are thereby relieved from the superincumbent weight of the wall. The Bank of England has very elegant examples of this.

Sometimes Palladian windows have two sets of columns, pilasters, &c. attached together with the glazing between them, so that there appears within the building a perfect colonnade, &c., and the same without. This has a most beautiful appearance. If this be executed, the specification should contain a description accordingly.

For Palladio's own windows of this kind, see his Architecture, and also Arundale's "*Select Specimens of the Edifices of Palladio.*" London, A. D. 1832.

CHAPTER LII.

SPECIFICATION *for the construction of a* GOTHIC WINDOW.

MASON. (See § 777.)

4643. To construct the window according to the drawings, with sill, jambs, mullions, tracery (*if any*) arch, label-moulding, and decorations entirely of stone, the sill ft. ins. high, ft. ins. wide, and ft. ins. long.

Jambs in courses ft. ins. high, ft. ins. wide, and bonded into the masonry (*or brick-work, as the case may be,*) of the walling in blocks alternately, ft. ins. long and ft. ins. long.

Principal mullions (*if any*) ft. ins. by ins.

Secondary mullions (*if any*) ft. ins. by ins., and

Minor mullions ins. by ins.

Moulded and embattled transoms with foliated arches beneath them (*if any*) ft. ins. by ft. ins.

Principal arch with the label-moulding cut thereon, scantling when finished ft. ins. by ft. ins., and foliated tracery cut and carved out of the solid stone with joints in the situations shown by the drawings.

4684. *All the horizontal joints in the jambs and mullions, and all the arch-joints in the window-head, are to be set with plates of 4 lb. milled-lead therein (or 6 lbs. to the foot superficial may be used in lar plate of lead*

being of the whole size of the section of the stone except half an inch all round toward the outer faces of the stone: each horizontal joint in the stone jambs and mullions is to have two strong copper plugs therein; all the vertical joints in the sills and transoms are to be plugged with lead.

4685. *If the arch-joints of the tracery and principal arch be also plugged with lead, the stones will be less liable to slide upon each other.* (See § 587.)

4686. *In windows which are too wide to have their sills in one length of stone, it will be well to lay under each sill a sheet of lead to prevent any wet which might pass through the joints from running into the building and down the walls.*

(Illus. §§ 200—1, and 3681.)

4687. *The careful architect will, in every window containing rich tracery, take care that the jambs and external arch are first completed, and allowed to subside and find their ultimate bearing and state of rest, after which the mullions and tracery should be inserted; for if they be previously inserted, the arch and jambs in settling will bear upon the mullions, and will sometimes ruin them. Want of such care has produced that effect in many ancient examples, although ancient Gothic windows are in general extremely well constructed. The mullions and tracery should always be considered chiefly as ornamental supports for the glazing; and even in the low class of expiring Gothic windows with flat heads, the stone window-lintels should always be relieved by circumscribing arches extending wholly or partially through the brick-work; and the same precaution should be adopted in imitation of the ancient windows consisting of three or more lancet windows divided by slender shafts, as at the Temple-church, London, the Lady Chapel Southwark, Salisbury Cathedral, &c.*

4688. *In modern English masonry (which has become in most edifices a mere shadow) it is customary to omit internal window-jambs and arches of stone; but this practice, which savours of sordid meanness, should be deprecated. From the erroneous modern idea of only present necessary stability, has resulted the almost universally rapid decay and dilapidation of our modern buildings, both public and private: they form almost one uninterrupted history of doing and undoing, of construction, destruction, and re-construction, while we have thousands of instances of ancient buildings, which, having been during the last three or four hundred years in a state of decay, have yet survived several generations of modern buildings, and are yet more sound than their modern competitors ever were.*

SMITH.

4689. To put to the window, as shown by the drawing, middle-bars of wrought-iron each ½-in. square, and a wrought-iron casement with middle-bars, hinges, and fastenings complete. (*The ends of the middle-bars will be better if tinned over.*)

4690. *If saddle-bars be made of cast-iron, they will corrode less, but will be more subject than wrought-iron to fracture from settlement of the building.*

CHAPTER LIII.

SPECIFICATION *for the construction of an* ORIEL-WINDOW *or* BAY-WINDOW.

MASON.

4691. To construct entirely of solid stone, the frame-work, mullions, tracery, transoms (*if any*), dado, sill, cornice, battlements (*if any*), paneled-work (*if any*), mouldings, and other work, decorations and appertenances, of the intended *oriel-window* according to the drawings, and the several dimensions figured thereon. The whole of the vertical joints in the stone-work are to be run with lead; all the projecting mouldings and exposed upper surfaces having proper water-joints channeled and run with lead.

4692. *If the roof be flat and concealed behind a battlement, or a crown-work of Tudor-flowers, it may be of stone projecting over to form the cornice of the oriel, with gargoyles or pipes to discharge the water from it. But if there be no such stone roof, it will be well to confine the head of the oriel from spreading out wider, by placing above the upper cornice a chain-rod or bar of copper, well secured at the ends of it into the main wall.* (*See portico,* §§ 4618 and 4641.)

4693. *If the oriel be covered with water-tables of stone, no other roof will be required unless the architect shall deem it well to lay under the stone-covering sheets of lead to prevent any damp from filtering through the stone-covering.*

4694. *If the oriel project before the face of the wall below it, the corbeilled-work supporting the oriel should be entirely of solid stone, tailed or bonded into the wall sufficient for preventing the weight of the oriel from causing the wall to settle down; and a strong arch of either brick or stone should be turned in the wall over the oriel.*

4695. *It is in vain to erect a pendent oriel except upon a firm corbeilling of stone-work; if the employer does not possess means or spirit to execute substantially this and other descriptions of beautiful appendages to buildings, they had better be omitted altogether; and a good and conscientious architect will not content himself with merely designing the shape of his works beautifully, but will be chagrined if they are not constructed well and durably.*

4696. *(If the dimensions of the oriel require any h zontal joints in the mullions, pieces of milled-lead shoul laid in them, the same as in columns ; each horizontal join the masonry should also have two plugs of copper.)*

SMITH.

Saddle-bars.

4697. To provide and fix in the stone frame-work of oriel-window No. tiers of wrought-iron saddle-bars ½ square, tinned at the ends thereof; and No. casement wrought-iron according to the drawings, with saddle-bars hin and fastenings complete.

4698. *(If it be intended that the oriel shall be gl with plate-glass, the iron saddle-bars will be best omitted any joins be needed in the plate-glass, the same can be made in rebated fillets of copper, and squares of plate-g can be framed in copper to serve as casements.)*

CHAPTER LIV.

SPECIFICATION *for an* ARTIFICIAL FOUNDATION *of* CONCRETE-WORK.

(See §§ 2891. 4419.)

(This was for a swampy situation, and may be omitted if not required.)

4699. To embank up all the internal ditches water-co pits ponds and excavations within upon or over the site of t tended establishment, so as to prevent the outer or bou ditches from draining themselves upon any part of the said s

4700. To pump away, draw off, bale out, and remove a water from the internal ditches water-courses pits pond excavations of every kind within upon or over every part site of the intended establishment; and to remove from the of the same all the mud, slime, old piles, planking, and wood-work, and to leave the whole thereof thoroughly cl from all filth, and with their sides bottoms and embankme sound as the general nature of the ground forming the site intended establishment will admit of.

4701. To perform all digging, ground-work, cartag labour, requisite in order to form the artificial foundation f intended buildings, and to render the platform of the who as hard and as well consolidated as possible.

4702. To form a continuous layer or bed of concrete-w

a foundation 3 ft. 6 ins. in depth for the intended buildings, to the extent shown in the plan by teints of yellow hatched over with diagonal lines.

4703. The concrete-work is to be formed in the proportion of six parts by admeasurement of clean Thames stone ballast, unscreened, and with rough and fine intermixed, and one part by admeasurement of the very best fresh burnt Dorking stone-lime (or other stone-lime as the case may be) beaten to fine powder on the premises without being slaked.

4704. The ballast and lime are to be thoroughly mixed with each other in small quantities at a time, the lime being slaked with a small quantity of water at the moment of admixture; sufficient scaffolding is to be provided and erected by the contractor, and all the materials of the concrete-work are to be from thence thrown down a depth of not less than 10 ft. into the bed of the work, so as to be the better consolidated in the intended layer of the foundation.

4705. The whole of the work of the artificial foundation is to be performed in the very best manner, the ballast and lime being each of the very best quality, and the workmanship thereof being done in the most careful and judicious manner, under the direction of the architect, and to his entire satisfaction.

(See note No. 10.)

END OF PART II.

APPENDIX I.

NOTICE FOR SHORING, &c., TO ADJOINING PREMISES.

4706. As it frequently happens that persons cannot take down, alter, or re-erect eir buildings without thereby endangering or affecting some adjoining buildings id property, and as the proprietors of such adjoining buildings and property metimes assert that no duty, under such circumstances, lies upon them to take re of their buildings and property, it is well to give timely notice to all parties ncerned in such adjoining buildings and property of an intention to take down, ter, or re-erect any building. Indeed, the giving of such notice is but just, asonable, and courteous, although it does not appear to be legally required, for the case of *Chadwick* v. *Trower and others*, argued in the Exchequer Chamber, id reported in Bingham's NEW CASES, vol. vi. page 1, it was held, that *the mere rcumstance of juxta-position does not render it necessary for a person who pulls wn his wall to give notice of his intention to the owner of an adjoining wall. Nor, he be ignorant of the existence of the adjoining wall,—as where it is under ground,— he bound to use extraordinary caution in pulling down his own:* and *Parke*, B., id, " The duty of giving notice in such cases seems to be one of those duties of imperfect obligation which are not enforced by the law;" " *We also* think it is impossible to say that under such circumstances, the law imposes upon a party any duty to give his neighbour notice."—See the same case, ol. iii. p. 334.

The expense of shoring up to adjoining premises may be recovered where rty-walls are rebuilt within the limits of the Building-act (B. a. § 41.), but as ose who have the work performed may, from the poverty or inability of the joining parties, fear the loss of an outlay for shoring, it may become a question ith them whether they are bound to perform shoring under such circumstances.

4707. The following form of notice to persons interested in adjoining pre- ises is suggested; and it is recommended that one copy thereof be served at the sidence of each of the parties connected with the ownership and tenure of e adjoining premises in question.

Form of Notice.

TAKE NOTICE, it being my (*or our*) intention, on or about the y of next, to take down my (*or our*) house (*or other building, as the casmay be, or which I or we now occupy*), situate and being No. (*or to remove certain portions thereof, as the case may be, and here state the particulars, making them as general and inclusive as possible*), I (*or we*) hereby caution and warn you and every of you to take such precautions as may be necessary for the support and maintenance of your premises, and of all walls, foundations,

floors, roofs, chimneys, vaults, cellars, and other parts and appertenances thereof, whether by shoring up or otherwise, as you and every of you may deem fit; and I (*or we*) hereby give you notice, that I (*or we*) will not be liable for any damage which your buildings and premises, or any parts thereof, or any goods, wares, chattels, or things whatsoever therein, may sustain in consequence of the removal of any of the materials of my (*or our*) said premises (*or the premises which we hold or occupy*) or in consequence of the removal of any vault, party-wall, party-arch, or other thing which will be removed by, or in consequence of, the taking down of any of the materials of my (*or our*) said premises (*or premises which we hold or occupy*). Witness my (*or our*) hand, this day of

To Mr. , the Owner
— Mr. , the Lessor } of the house
— Mr. , the Tenant } or premises.
— Mr. , the Agent

And to all whomsoever else it may concern.

APPENDIX II.

4708. *Form for a Contract.*

tion for ance of

I, of in the county of , builder, do hereby agree in consideration of the sum of sterling, to perform for of in the county of , with the very best and the most approved labour workmanship and new materials, all the works matters and things which will be requisite to be done in and for the erection of a new at in the parish of in the county of , and to complete the said according to the specification hereto attached, and according to the working-drawings referred to by the said specification and signed by the said , and to render the said with the buildings and appertenances thereof, fit for occupation, and so that no charge of any kind may arise and become due to me beyond the said sum of on account of the performance of any works matters or things to the said buildings and premises unless directions shall be given for some alterations to or for some enlargement of the said works matters and things. I DO HEREBY FURTHER AGREE to make good at my own expense all injury and damage which may occur by reason of the execution of the said works matters and things hereby intended to be done, whether the said injury and damage may occur to any part of the buildings and premises of at or upon which the said works matters and things are intended to be done, or whether the said injury and damage may occur to any other buildings premises property or things whatsoever. I DO ALSO HEREBY FURTHER AGREE to perform the whole of the intended works matters and things, under the direction of the architect of the said , and that I will complete the whole

nal llowed direc-

(*Time of the completion of the work.*) of the said intended works matters and things, (except the last two coats of paint upon the wood-work, and except the painting colouring whiting and paper-hanging upon the (new) plastering, and except also

by or before the day of now next ensuing, and that I will complete the whole of the said intended works matters and things, of every kind during the months of next,

(*Penalty for non-completion of the work.*) under the penal sum of sterling for each and every day that the said several works matters and things shall in either case remain incomplete after either of the several times aforesaid, to be in case of such default deducted as liquidated damages from the aforesaid sum of

I DO HEREBY ALSO FURTHER AGREE that I will not in or about the execution of the said intended works matters and things, use any unseasoned or inferior materials, or any materials other than such as are intended by the specification to be used. I DO ALSO HEREBY FURTHER AGREE in and about the execution of the said intended works matters and things to follow the direction of him the aforesaid architect, and that he the aforesaid architect shall have full power to direct any alterations in the manner of carrying on or of finishing the said works matters and things, without thereby vitiating or impairing the force of this agreement, and that he the aforesaid architect shall determine and allow such extra time as he shall think just for the performance of any additional works which he may direct to be done, and shall also arbitrate and settle any difference of expense which may thence justly arise, and which difference of expense (if any) shall be settled and determined according to the schedule of prices hereto attached, so far as the same will apply, and all prices not contained therein are to be reckoned after the same rate of cost and profit as those contained in the said schedule, and that in such case, and in all other cases relative to the said intended works matters and things, hereby agreed to be done, the decision of him the aforesaid architect shall be final and conclusive upon and against all the parties concerned therein*.

(*Materials to be seasoned and according to the specification.*)

(*Work to be done under the direction of the architect, who may make alterations therein without vitiating this agreement.*)

(*The architect to be sole arbitrator.*)

(*Sometimes contracts contain an allowance of so many days extra time for every* 100*l. of additional work, but such an allowance must depend upon the difficulty of the work.*)

(*Payment.*) PAYMENT of the consideration for the due performance of the works matters and things hereby intended to be done, and for any extra works which may by the aforesaid architect be ordered, is to be made to me by the said

after the following manner, that is to say,

1*st Instalment.* within *fourteen days* after I shall have produced to him a certificate signed by the aforesaid architect, stating that the carcase-work of the buildings is carried up to the height of the one-pair story thereof, and that the timbers of the one-pair flooring thereof are laid and

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* 4709. There is at present an objection made (on principle it is said) by some contractors, to the architect being sole arbitrator, though the author has found others of them desire that the architect should be so, and thus gain his unalterable settlement of a business without expense and without hazard: the author has but very rarely found any objection made to this mode of adjustment, and upon his offering to allow of final adjustment by another party the objection has been at once given up: he has lately had, indeed, an instance, wherein his arbitration was not stipulated to be final, in which some contractors, aware of this want of power, attempted every description of fraud, evasion and overreaching, in addition to the use of much personal abuse; this instance, which was indeed one of ruffianly conduct, is sufficient to determine the author never to allow of the omission from his contracts of the placing of the arbitration in himself, or in some previously determined disinterested architect of known probity. If reputable contractors are *afraid* to work under any particular architect their best plan is to shun him altogether; this will almost instantly work the cure which they desire; whereas they will lose many extensive works by uniting in the refusal of the architect's arbitration, with dishonest contractors who solely undertake a work for the purpose of evasion, the claim of extra charges where an honest man would ask for none, and the worrying of the architect and of all parties concerned in the affair.

fixed, he the aforesaid shall pay to me the sum of That

2nd Instalment. within *fourteen days* after I shall have produced to him a like certificate signed by the aforesaid architect, stating that *all* the carcase-work and the roofs and gutters of the buildings are complete, he the aforesaid shall pay to me the further sum of .

3rd Instalment. That within fourteen days after I shall have produced to him a like certificate stating that all the intended works matters and things are completed, (except the painting as aforesaid, and except the colouring whiting and paper-hanging to the plastering, and except also) he the aforesaid shall pay to me the further sum of , and lastly, that within *four*

Balance. *calendar months* (*or state such other time as may be agreed upon, taking care that not less than three months' summer weather may pass over the work and prove it*) after I shall have produced to him a like certificate signed by the aforesaid architect, stating that the whole of the works matters and things of every kind, hereby intended to be done, are wholly completed, he the aforesaid shall pay to me the full balance of the monies to become due to me for the full performance of the said intended works matters and things, subject however to this especial proviso, that in case any blemishes failures or imperfections shall before the payment of the said final balance appear in any of the said works matters and things hereby intended to be done, that I shall nevertheless amend and make good at my own cost to the satisfaction of him the aforesaid architect, all such blemishes failures or imperfections, as though I had never produced the aforesaid certificate. [Provided always, that the payment of such balance so to be left as aforesaid, is not to protect me, the said from any liability that I may justly be subject to at any time on account of my not having well and sufficiently performed all that I have above contracted to do. Provided also that in case I the said shall at any time before the full completion of the said works matters and things, improperly delay the execution thereof, it shall be competent to the said architect on giving to me fourteen days' notice in writing of his intention so to do, to employ any other person or persons to complete the same, and in that case all such sums as shall have to be paid to such other person or persons so completing the said works matters and things, shall be deducted from the sum to be paid to me as above mentioned, and in case such sum shall not be sufficient, I hereby agree to pay to the said any deficiency which may thence arise.] All the spare old materials which will not be required and allowed to be used in the new works, are to be taken away by me from the premises as my own property, with the exception of , and except also such of the old wood-work as is only of use for fire-wood, which and which fire-wood I am to deposit for the use of aforesaid in one of the out-buildings of the said premises (*or in such other place as may be agreed upon*). Witness my hand this day of in the year one thousand eight hundred and .

(Signature.)

Witness

(Contractor to make good all defects before payment of balance.)

(The agreement may contain a condition that the contractor shall relay all floors, and make good all other wood-work which shall have shrunken more than $\frac{1}{32}$ of an inch at any joint thereof.)

(These clauses for reimbursing in case of defects, and for employment of other tradesmen, which have been added by a solicitor, may be retained or not as may be judged best.)

(Disposal of old materials, if any.)

APPENDIX II.

If the contractor require the employer to ratify the agreement, and a regular deu-partite contract be not drawn up by a solicitor, the following words may be added :—

I hereby accept the above agreement for the performance of the works matters and things to be executed by , and I undertake to make the payments and to perform whatever else may be requisite on my part, under the said agreement. Witness my hand this day of in the year above written.

(Signature.)

Witness

The body of the contract may also very properly contain the following provision against the employment of workmen at task-work, which practice is found to occasion neglect and abuse in workmanship, and constant insult to the superintendent of it.

I DO HEREBY ALSO AGREE that I will not let any of the said work to workmen at task-work, nor have any of the said work performed in any manner as task-work, under penalty of forfeiture of the whole cost and value of any such work which may be so performed.

APPENDIX III.

General Conditions which may be added to a Specification.

No. 1.

4710. The contractor is to perform the whole of the works in the very best manner, with the very best and the most approved materials and labour of their respective kinds; he is, under the direction of and to the entire approbation of the architect, to provide fix and execute all works which are specified represented or implied in or by this specification, or in or by the drawings thereby referred to or either of them, or which may be requisite for rendering every part of the buildings works and appertenances complete, and to make good all damage caused by the execution thereof without any charge of any kind thence arising and becoming due, except the amount of the consideration of the contract; and the architect is to have power to order any alterations in the form of the structure or of the finishings thereof without vitiating the contract, and the difference of expense (if any) caused by any such alteration so directed shall be ascertained after the rate of the schedule of prices hereto attached; and if such schedule be found in any manner deficient, then the aforesaid architect is to calculate and determine such additional prices as may be requisite, the same being after the same rate of cost and profit as those contained in the said schedule.

(any of these articles be contained the contract for execution of work, they ould be omitted re.)

The contractor is to provide rods marked with the different heights and widths of the several parts of the buildings, and is to make himself answerable for the perfect correctness of every part of the works.

General Conditions which may be added to a Specification.

No. 2.

4711. The contractor is to perform in the very best manner, with all proper labour and workmanship, and with all proper materials of the very best quality, all works whatsoever which may be requisite for executing the buildings and works and their appertenances in every respect, according to the drawings and design thereof; the said contractor is under the direction of the architect (*for the time being*) of and to his satisfaction to

provide fix and execute all works which are mentioned in this specification, also all works which are shown by any of the drawings, and also all works which may be reasonably implied by such specification and drawings, or either of them, and which will be necessary in order to render the whole thereof united and finished with each other, so that the whole of the premises of the intended with their buildings works fittings and appertenances of every kind, may be fit for the immediate use or occupation of and so that no sum or sums of money beyond the amount of the consideration of the contract may become due, unless an order in writing be made for the same at any time during the progress of the works by , or by the architect (*for the time being*) of the said , and it is to be fully understood by the contractor that the architect (*for the time being*) of shall have power to direct any deviation in the manner of carrying on, or of finishing the works of the , without thereby vitiating the contract for the works, and the said contractor is finally to leave the whole of the premises and the buildings and their appertenances of the whole of the intended , in all respects perfect.

(If any of these articles be contained in the contract for the execution of the work, they should be omitted here.)

NOTES.

NOTE 1, PART I., CHAP. 29, § 292.

Portland Stone.

4712. It is to be regretted that, in the present age, research should be terminated by a comparatively profitless conclusion. About three years ago the author projected a tour to our principal quarries, and performed a small portion of this tour: the necessity for this has been in a considerable degree superseded by the Government undertaking of the year 1838, by Messrs. Barry, De la Beche, W. Smith, and C. H. Smith: but the deductions from the collection of so valuable a body of information, are of rather a fearful nature. From the first coming into repute of the Portland quarries, Jones, Wren, Hawksmoor, Flitcroft, Gibbs, the Dances, Taylor, Chambers, Soane, Smirke, and other sterling English architects, have in succession used its beautiful stone in every good building, and some of them never chose any other kind. In most cases, the masonry of the oldest buildings by these architects, who were always curious and exact in the construction of it, is more perfect than that of any recent modern edifice of inferior stone. One would have supposed that the example and success of these chiefest men in their profession would have caused no slight pausing before entrance upon the recommendation of an inferior material for the Houses of Parliament. The real cost, however, of Bolsover-moor stone, will, it is to be hoped, if nothing else can, do that which good taste could not, and save a sumptuous and magnificent building from the infliction upon it of a nasty fullers' earth aspect: besides rustiness of colour, this material is fit only for masonry of mean quality: the thinness of its beds, which are only from eight to twenty-four inches, renders it totally unfit for window-mullions: placing the stone on end, or the mixing with it for such a purpose the product of other quarries, is alike to be deprecated by good practice and by good taste. Let those who wish to see stone perfect in colour and condition, examine the Portland stone columns of the porticos of Chelsea Hospital, in those respects perhaps the finest in the world. Those who having been reduced, by bad times and bad public judgment, to a sort of necessity to sacrifice goodness of material for elaborate architecture, visionary and quickly decaying, and who have thus succeeded under the colour of economy and superior talent, in obtaining high station in their profession, may then cease to tamper with good architecture, and may resolutely refuse to build with other than the best masonry: if they use the choicest Portland stone, their work will remain, and will rank with those of their justly-celebrated predecessors. The Reform Club-house, now erecting in Pall-mall, which will probably outlive its political destination, is both an instance of the wise substitution of Portland stone for inferior material, and of the success of employing symmetry, boldness, and simplicity of architectural character.

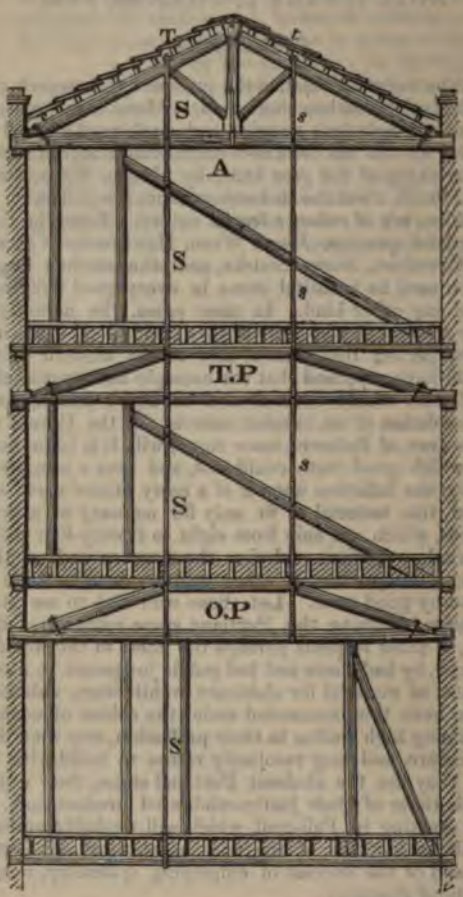
NOTE 2, CHAP. LI., PART I., § 449—62; and CHAP. LX., § 544—50.

Construction of new Quartered-Partitions, and Remedy of the Damage caused by the failure of old Quartered-Partitions.

4713. In the construction of quartered-partitions which have any burthen to bear, it is best to carry a tie-plate over each door-way and to form a truss between that and the next floor, and if possible to put also a strong truss in the

roof immediately over each quartered-partition; thus all dangerous settlement in the partitions may be prevented: any one of these trusses if constructed strongly enough may be made to carry all the burthen of the floors of a house, either by bearing the weight on its back or by suspension to it: if an old house have sunk in its centre from the weight of the floors upon an ill-constructed stack of partitions, it will in general be best to insert a strong truss above the heads of the doors on the two-pair story.

Stack of Partitions with the common Quarterings omitted.



O. P. Truss over the doors of the one-pair story: where there are folding-doors, such a truss is generally too shallow to be very effective.

T. P. Truss over the doors of the two-pair story.

A. Truss in the roof over the attic story, more effective than either of the others.

S. Strap of wrought-iron passed over the back of the upper truss down on both sides of the stack of partitions and under the lower plate of the stack of partitions, or through a girder over the ground-story, and bolted through at every intersection of it with the cross-timbers, so as to hang up the floors at all possible places.

s. Strap as the last, only carried down to the head of the folding doors.

These straps should not be permanently screwed up, nor should the cross-bolts be screwed through them, till the wood has seasoned as much as possible, for fear of the shrinkage of the timber lessening the distance from bolt to bolt, and so causing the iron straps to bulge out and become useless.

4714. All the plates and cross-ties of such partitions should be made to camber very considerably, the camber gradually increasing as the stories ascend; and all the floors, ceilings, and door-heads, should conform to this camber, which should not be less than half an inch on the one-pair floor, an inch on the two-pair floor, and an inch and a half on the three-pair floor, and so in proportion; if this precaution be not taken, you may be sure in less than two years to find the floors and ceilings fall out of level in their centres as much, both from the shrinkage of the timber and from the strain upon it from burthen. The door-architraves fixed on such partitions invariably strain out of square at their angles more or less in proportion to the dryness of the timber, the skill exercised in trussing the work, and the degree of burthen cast on the partitions; therefore all such architraves should have their heads fixed out of level so as to settle permanently to a correct square form, instead of being fixed level to settle permanently out of square. In general, plates immediately above the floors should be omitted, as the more horizontal timber there is, the more shrinkage there will be, and consequently the more settlement; and as such plates mostly require to be cut through for door-ways, they are rarely of use as ties to the work: under each end of each truss a templet of granite street-curb 3 or 4 feet long, or some other durable and incombustible fulcrum, should be set: these should be strongest and longest where the trusses act with most energy.

NOTE 3, CHAP. LII. PART I. § 463—476.

A Method of increasing the Magnificence and diminishing the Material of Bridges, deduced from the System of Abutments of Pointed Architecture.

4715. The system of abutments developed by the study of the *Pinnacles and Flying-buttresses of Pointed Architecture*, exhibits a means of improving the economy and beauty of modern bridges.

It is just matter of regret, that however successfully and ingeniously they may be constructed, the huge masses of their materials too often present but a mean and vulgar appearance, from being designed by men of rude and uncultivated taste and feeling; and the kind of ornament in which they do indulge, too often degrades the work in the eyes of persons of cultivated and elegant mind. The part of a modern English bridge which the greater part of observers see, viz. the parapets, being mostly of an unimposing and coarse fabric, such works are passed without exciting wonder, admiration, or respect; and when the sides of a bridge are defaced by a paltry and ill-designed iron railing like that of the Southwark bridge, instead of admiring the wonderful span of the arches of the structure, the mind is occupied in regretting the meanness and tastelessness of that alone for which the bridge was built, viz. the road-way.

4716. Suspension-bridges, though in general mere make-shifts, possess, when properly designed, in their lofty suspension-towers, objects which render them grander and more imposing in appearance to the passenger, than any of our most costly stone bridges: even the pedestals and candelabra of the new London bridge shew the good effect of a little taste, though not accompanied by any thing extraordinary in dimension.

4717. Now in our bridges there is no sparing of expense, and their structure is in general admirable: but if it can be shown, that with the same or with less expense, as much or more security can be procured, with an effect more imposing to the passenger, that must be an economical and beneficial development.

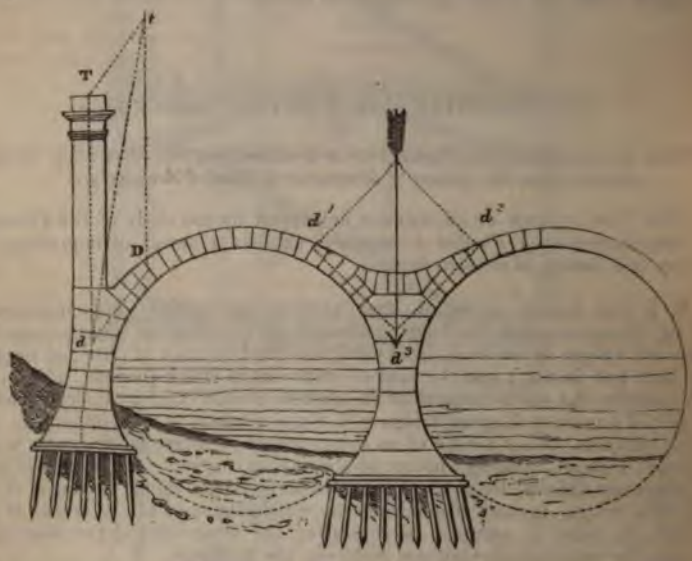
4718. In general our bridges, when not built between high rocky shores, have

enormous masses of material buried in the earth, to form resisting abutments at the ends of such bridges.

4719. Now if instead of concealing such immense masses of expensive work, but comparatively small abutments were made, but carried up nobly at each entrance of the bridge in the forms of lofty triumphal-arches, all meanness of appearance would vanish, and the rising masses of work acting as pinnacles, would diverge the drift of the arches almost perpendicularly on the ground.

4720. These triumphal-arches should be made with central apertures as wide as the roadway, and side ones as wide as the footways; the whole structure being wider than the main body of the bridge itself, by the substance of the four piers of the arch: the higher and grander these arches are made, the smaller may be the abutments.

4721. Nothing of the same kind should be added over the piers of the bridge; for the drifts of the arches mutually changing each other, descend unitedly perpendicularly to the foundation, and any additional weight would cause a positive injury.



D—*d*. Drift of the side arch towards the abutment.
T—*d*. Profile of a tower or triumphal-arch raised as a pinnacle above the land-abutment.
t—*d*. Inclination of the drift after it has combined with the perpendicular gravitation of the tower or triumphal-arch, continuing down to the ground more and more inflected to a perpendicular line.
d^1—d_3 } Drift of two other arches meeting together at d^3 and afterwards descending *perpendicularly* to the base of the pier.
d^2—d_3 }

4722. Perhaps if these piers were built of the largest procurable blocks of the hardest and most durable granite, and were set in a pitchy or bituminous cement, they might be reduced to less than half their ordinary area, except in their foundations, which indeed but too often are insufficiently spread.

NOTES.

NOTE 4, PART I., CHAP. LXII., § 558—69.

Wrought Iron Breast-summers.

4723. Since this chapter was written, the author by chance obtained a copy of the singular though clever little work entitled "*Nutshells*," published in the year 1785, under the assumed name of "*Jose Mac Packe, a Bricklayer's Labourer*," which he had read many years before, but the particulars of which he had forgotten: he deems no apology necessary for extracting from it the following quotation :—

"Whenever the Legislature shall think proper to enforce the general use "of this excellent contrivance in all future buildings, the present Building-act "may be repealed, and be consigned to that oblivion it most justly merits. In "any future act, it would however be essential that the absurd custom of "building upon breast summer fronts of timber-work should be universally re-"strained, and instead thereof, wherever a similar mode of construction is "necessary, the superincumbent wall should be erected upon iron cradles, bent "into regular curves, which should be secured at their bases, or springings, by "proper tyes and abutments, and be supported by iron standards, the whole to "be of wrought and even faggoted iron, but by no means of cast iron; the longer "this regulation is neglected, the greater number of useful and valuable lives "are in danger of perishing by fire, or by the effects of fire, as too many recent "instances have most deplorably shewn."—Page 85.

NOTE 5, Part I., CHAP. XCV., § 751.

Grecian Symmetry.

4724. There is a peculiar species of symmetry in the ratio of the larger and more minute parts of the orders of Grecian architecture, with which the author has been acquainted about twelve years, although he does not remember the fact to be noticed in any work hitherto published, and has never heard the subject mentioned by any one: *this consists in making upright members, and projecting members, visually equal to each other, whatever their profiles;* and though there may be many examples of deviation from the rule, that it was a governing rule is evidenced by the most celebrated specimens of architecture bearing its test, whatever their forms and contours; and in those specimens which are universally considered the most perfect, the rule is the most exactly observed; as, for instance, the perpendicular height of the abacus and the diagonal breadth of the echinus agree with each other in the Athenian Doric capitals of the Parthenon, the Propylæa, the Agora, and the Temple of Theseus, in that of the Propylæa of Sunium, and in that of the Propylæa and of the internal order of the Temple of Ceres and Eleusis: all these capitals possess a pleasing harmony of proportion; but the capitals of the columns of the portico at Thoricus, being formed greatly in violation of this classical rule, shock the eye: this latter example was injudiciously imitated, merely for novelty, within the church in North Audley-street, London, where the excessive height of the echinus and the shallowness of the abacus, evince at a glance an unusual want of symmetry.

4725. In the entablature of the Parthenon, the altitudes of the architrave and frieze, and the diagonal width of the cornice, are all similar. In the example of the Agora, which shows the falling off of later times, the height of the frieze and the diagonal of the cornice agree, but the architrave of the order being narrower, a want of symmetry is in consequence at once proclaimed.

NOTES.

4726. In the Ionic example of the small temple on the river Ilissus, if the same rule at first appear not to be so strictly observed as in the Parthenon, the master-breadth or module taken in the compasses, will be found to fall, as in many other specimens, within the beads or other small mouldings separating the entablature into its three chief divisions; but if the quirk under the upper fillet of the architrave be taken as the *visible* division between the architrave and the frieze, the rule will be found to be almost exactly observed; and, indeed, the upper edge of a fillet in such a situation is scarcely observable, unless, as in the case of the Doric order, where the perpendicular lines of the triglyphs contrast with it.

4727. In the Corinthian order, the Greeks appear to have made the united height of the architrave and frieze to correspond with the diagonal breadth of the cornice; and this rule was not lost, even in the latter days of Greece, since it is to be observed in the example of the Arch of Adrian, at Athens; and the governance of the same rule is even to be found at Rome in the Arch of Titus; the same rule is observed, too, in the Ionic order of the Aqueduct of Adrian.

4728. Much more could be subjoined upon this subject: that which is here adduced is sufficient to awaken attention to it; and to incline the student to endeavour to unite, by symmetry, the otherwise scattered parts of his architecture rather than to disunite them by the optical disunion of *polychromy*, which, if used in good times, could never have extended beyond the deceptive enrichment of mouldings, which parsimony or want of funds had occasioned to be left plain at the first building of a temple, something in the same manner as a modern paper-hanger pastes up sham enriched cornices in the plainest rooms.

NOTE 6, PART I., CHAP. CVII., § 859.

Delegation a structural evil from changing Substance into Burthen.

4729. Delegation is here intended as a term for the *error* in building *of referring beams or other parts of structures to some other materials for support, instead of supporting their own burthen.*

4730. If a beam support a series of joists, it must be strong enough to bear the required burthen, which will be increased by the weight of the joists, while the strength of those joists will support no part of the weight of the beam.

4731. The quantity of material consumed in the girders of a floor, will bear all the burthen to be supported except that weight which will be supported by the walls themselves; hence, if the quantity of material in the girders be divided so as to support conveniently the flooring-boards, all the material which would otherwise be used in the joists, will be saved, and an excess of strength will arise; so that even the quantity of the material in the girders may be diminished: for not only will the burthen of the joists be taken away, but the materials will be saved from all the wounding caused to it by tenoning or otherwise fixing joists into or upon girders which frequently destroys from one fourth to one half of the strength of the material.

4732. The arrangement of girders and joists only becomes necessary, where too minute a subdivision of the breadth of the timber into joists, would render those joists too thin for practical purposes, and cause them to tremble laterally, and to split by nailing down the flooring-boards.

4733. Hence, the waste of material consequent upon the construction of floors with long bearings, renders them proportionately much more expensive than floors with short bearings.

NOTES.

4734. Again, the practice of placing the trusses of roofs far apart, causes a total waste of the timber in the purlins which consequently become necessary for the support of the rafters.

4735. If the trusses of roofs be made to contain rather less than half their usual quantity of material, whether timber or iron, and be placed only 5 feet apart, instead of 10 feet apart, such roofs may be made less expensive, lighter, and stiffer; for by placing the rafters horizontally, the gables and trusses of the building will be tied firmly by every rafter, purlins and slate-battens will be wholly saved, all window-heads and other weak parts of the building will be wholly relieved from the weight and thrust of the rafters, and every part of the roof will fall simply with its mere weight upon the walls and supports of the fabric. In such case the rafters for the support of Duchess slating should be 3 ins. by 1¾ in., and be placed 8½ ins. apart; and for Countess slating 2½ ins. by 1½ in., and 7 ins. apart, thus they will suit properly the bond: in other cases calculation must be made according to the distance of the trusses, and also according to the length of the slates, upon which the distance of the rafters from each other, and by consequence the weight which each of them will have to carry, will depend.

4736. In this case, do not listen to the sophistry which any prejudiced or unscientific builder may use to convince you that making trusses light will increase their expense: for you may rest assured, that if you require them to be made very heavy and unwieldy, an extra price per cubic foot will be demanded for the trouble of moving and setting up such work.

NOTE 7, § 1430.

Curbed-Roofs.

4737. Curbed roofs are principally used in London, either for the fiction of inclosing some small addition to a building wholly within a roof, instead of inclosing such addition within walls of the proper rate, or else for containing a whole story in such buildings as would be altered in rate by the number of their stories, or would at least require party-walls of a higher rate; but their construction is almost universally condemned.

Pierre Bullet, who appears to have been one of the most cautious and enlightened practical architects who ever existed, no great while after the introduction of those abomination *curbed-roofs*, published the following admirable condemnation of them.

4738. " M. Mansart n'a pas esté le seul qui ait tronqué ses combles, à l'exem-
" ple de celuy du Louvre : l'on peut remarquer que le comble du Chasteau de Chilly
" dont M. Metezeau a esté l'Architecte, est aussi de cette maniere, & qu'il a
" mesme esté fait avant celuy de Maisons. Il peut y en avoir en d'autres
" endroits qui n'ont pas esté remarquez ; mais ce que l'on peut croire en cela, est
" que les Architectes n'ont tronqué les combles, que parce qu' estant faits par les
" anciennes regles dont ils se servoient, ils les trouvoient trop hauts, par rapport
" à la hauteur des bastimens sur lesquels ils estoient posez."

" Nos anciens Architectes François ne nous ont point donné d'autres regles
" certaines & déterminées de la hauteur dont ils avoient de coûtume de faire leurs
" combles, par rapport à la largeur de leur bastimens, que ce que nous voyons
" par tradition de ce qui reste des anciens bastimens. Ceux que j'ay remarquez
" de meilleure Architecture, ont autant de hauteur que tout le bastiment a de
" largeur hors œuvre ; c'est-à-dire que si le bastiment a six toises de largeur, le
" comble doit avoir six toises de hauteur ; ce qui est une élevation excessive. Il
" y en a d'autres qui se sont plus moderez ; ils n'ont donné de hauteur à leur
" combles, que le triangle équilateral, dont les costez sont toute la largeur du

" bastiment ; c'est-à-dire que prenant cette largeur ils en ont fait la longueur " penchante du comble. Voila à peu prés les regles generales dont les meilleurs " de nos anciens Architectes se sont servis, & même ceux de ce siecle. Il peut " y avoir des combles d'autres proportions ; mais ceux que je viens de marquer, " m'ont paru le plus en usage."

" La trop grande hauteur des combles a causé encore un autre abus, qui est " qu' étant beaucoup élevez l'on a voulu faire des logemens au dedans, & pour " cela il a fallu faire des lucarnes pour les éclairer ; *ces lucarnes sont devenues* " *ordinaires, que l'on a crû qu'un bastiment ne pouvoit estre beau sans y avoir des* " *lucarnes, & même autant qu'il y a de croisées dans chaque étage, & aussi grandes que* " *ces croisées.* L'on a orné ces lucarnes de pilastres, de frontons de differentes " manieres, avec beaucoup de dépense ; on les faisoit ordinairement de pierre de " taille aux grands bastimens ; mais à present on les fait plus communément de " charpenterie recouverte d'ardoise ou de plomb, aux combles qui sont couverts " d'ardoise ; mais à ceux qui sont couverts de tuille, on recouvre la charpenterie " des lucarnes de plastre."

" Il n'y a pas d'apparence que ceux qui connoissent la bonne Architecture, " puissent approuver les lucarnes ; car c'est une partie qui est comme hors d'œuvre, " & qui ne peut entrer dans la composition d'un bâtiment sans en gâter l'ordon- " nance, surtout quand elles sont grandes & en nombre ; car outre que cet " ouvrage est au dessus de l'entablement, & par consequent hors œuvre, il est " contre la raison qu'il y ait des ouvertures considerables dans la couverture d'un " bastiment ; & puisque cette couverture n'est faite que pour mettre la maison à " couvert, & qu'il semble qu'il n'est pas raisonnable qu'il y ait des trous dans une " couverture, outre ceux qui doivent donner de l'air & du jour dans les greniers, " que l'on appelle œils de bœuf, qui ne gâtent point la figure des toits. Si l'on " objecte qu'il faut des lucarnes pour monter les foins & autres choses de cette " nature dans les greniers, l'on peut répondre que l'on ne met point de foin dans " les greniers des bastimens considerables ; on le met dans les greniers des bas- " timens de basses cours."

" Les lucarnes ont encore attiré un autre abus qui est contre la bonne " Architecture ; c'est que quand on veut faire des logemens considerables " dans les combles, on se donne la licence de couper les entablemens au droit " des lucarnes, pour avoir la liberté de voir de haut en bas : cette licence " est une chose ridicule, & entierement contre le bon sens ; CAR L'ENTABLE- " MENT DOIT ESTRE LE COURONNEMENT DE TOUT LE BASTIMENT, AUQUEL ON NE " DOIT FAIRE AUCUNE BRECHE PAR QUELQUE NECESSITE QUE CE PUISSE ESTRE. " C'EST POURQUOY IL NE PEUT Y AVOIR QUE DES OUVRIERS LES PLUS GROSSIERS " QUI PUISSENT ESTRE CAPABLES DE FAIRE CETTE FAUTE.

" L'on pourra objecter à tout ce que je viens de dire, que le dedans des " combles donne de grandes commoditez, & que c'est perdre ces commoditez, que " de n'avoir pas la liberté d'y faire des lucarnes pour les éclairer. Il est vray que " si l'on veut faire des combles aussi hauts comme les anciens, que l'on perdra de " la place ; mais si on veut moderer cette grande hauteur & faire des combles " plus plats, l'on pourra retrouver ces logemens dans un étage en Attique que " l'on peut faire au lieu des combles si élevez. Si on veut bien examiner la chose " & se déprendre de l'accoûtumance de voir des combles si élevez, l'on y " trouvera peut-estre plus de beauté & moins de dépense. A l'égard de la " beauté, j'ay déja fait voir que les bastimens des anciens Grecs, qui sont ceux qui " ont perfectionné l'Architecture, n'avoient des toits que de la hauteur des " frontons ; ce que l'on pratique encore par toute l'Italie où sont les plus beaux " bastimens. Pour la dépense, si l'on veut examiner ce que coûte un grand " comble plus qu'un comble plat, soit en charpenterie, en couverture, en lucarnes, " en lambris, & en exhaussemens sous le pied des chevrons ; je m'assure que l'on " trouvera peut-estre plus de dépense que d'élever un petit étage quarré, & outre

" cette dépense l'on aura pour incommodité le rampant des jambes de forces & des " chevrons, ce qui oste toutes les commoditez des logemens en galetas, & par " dessus cela ces mesmes logemens seront fort brûlans en Esté, à cause que le " Soleil échauffe beaucoup l'ardoise & la tuille, & fort-froids en hyver par des " raisons contraires."

4739. Added to the natural ugliness and imperfections of curbed-roofs, those of London are generally made still more faulty by the plates of them being cast off the walls so as to rest upon and to bend the joists of the attic flooring upon which they are placed.

NOTE 8, PART I., CHAP. XIX., §§ 2349, 2354.

Moulded Bricks.

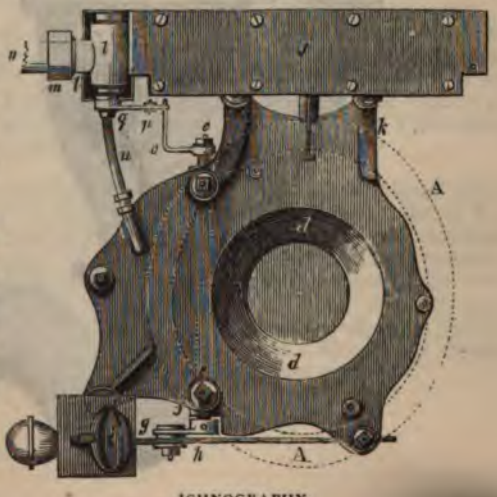
4740. The legal fetters upon making bricks of various forms, having been removed by the new act of the 2nd and 3rd Vict. cap. 24, which imposes a duty of 5*s*. 10*d*. per thousand upon bricks, each containing, before being burnt, not more than 150 cubic inches, and 10*s*. per thousand if of larger dimensions; there no longer remains any reason why bricks should not be made of any desirable shape and dimensions. For the formation of moulded bricks, Mr. Bakewell's Patent Screw Presses afford superior facilities of manufacture and exactness, and by their great mechanical powers of compression acting upon the clay, create superiority of texture and hardness: by means of them, white or other bricks may have impressed on their ends, the form of a leaf, or any other ornament, so as to produce at a trifling cost, the most beautiful bed-moulds and other decorations for the exterior of buildings.

NOTE 9, PART II., CHAP. XLVII., § 4589.

Findon's Water-closets.

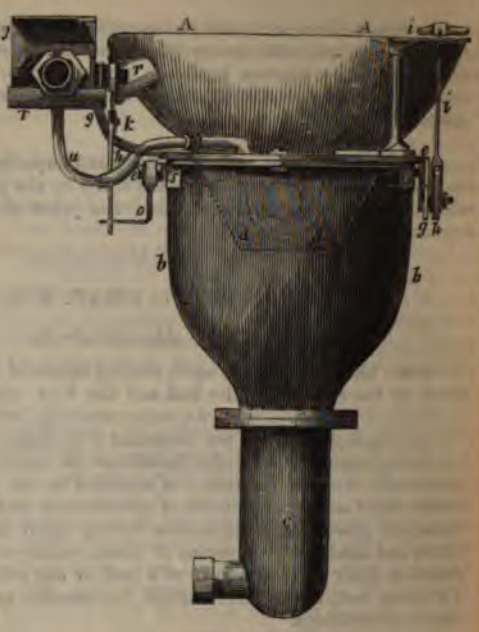
4741. The advantages which these water closets possess, are their simplicity, and the proximity of a supply of water to the basin itself. The author had lately to erect a stack of water-closets in such a situation as that the cistern could only be

A. A. Earthen basin.
b. b. Cast-iron chamber on which the earthen basin is fixed.
c. c. Cast-iron stench-trap.
d. d. Copper pan.
e. e. Axis on which the copper pan turns.
f. f. Bearing of the axis.
g. Arm or crank.
h. Lever which actuates the arm or crank and thus empties the pan.
i. i. Handle by which the lever is raised and lowered.
j. j. Service-box with an air-pipe.
k. k. Feet by which the service-box *j. j.* is secured to the iron chamber *b. b.*
l. Service-cock attached to the service-box *j. j.* opened and shut by the motion which actuates the pan *d. d.*

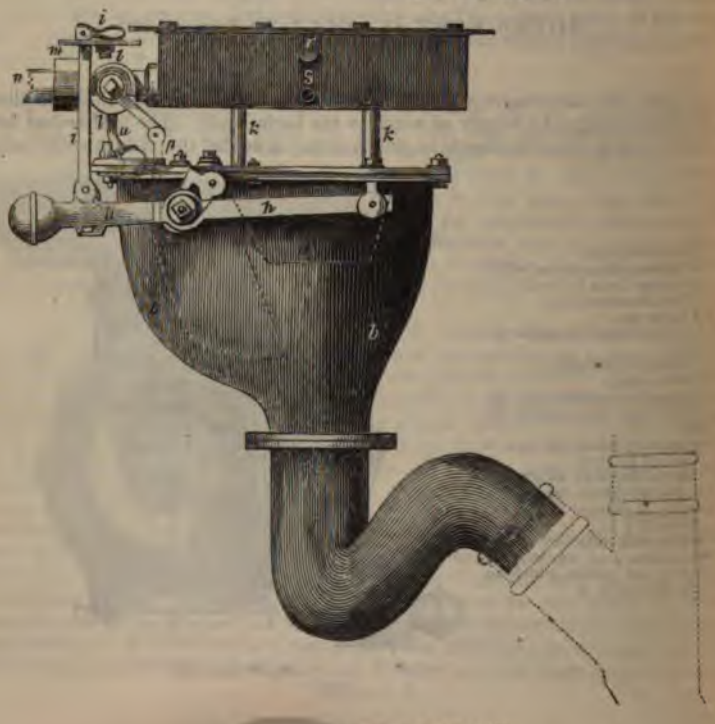


NOTES.

m. Union-joint connecting the cock with a cistern.
n. Pipe from a cistern placed any where.
o. Crank-arm received by the end of the axis *e*. *e*. projected through the chamber *b*. *b*.
p. Bar connecting the crank-arm last mentioned with the arm of the cock from the service-box.
r. Pipe which supplies water over the top of the basin while the cock is open, and which becomes an air-pipe when the cock is shut.
s. Pipe which gives the after supply of water which is to remain in the basin, assisted by the air-pipe *r*.
t. Receiver for conveying off any leakage which may result from the wearing of the joint and pipe.
u. Pipe conveying into the iron chamber any leakage-water.



SIDE ELEVATION.



ONT ELEVATION.

placed at a distance of near 50 ft. from the lower one ; the ordinary kind of apparatus was at first made use of, but no person having patience to wait till the basins were cleansed by water coming from such a distance, they became a source of serious annoyance in the house ; and the defect was increased by the length of the wires and the complex nature of the crank-work ; upon the substitution of Findon's apparatus for the other kind, the annoyance ceased. It appears that this patent invention has been twice parodied, and injuriously so.

NOTE 10, PART II., CHAPTER LIV., § 4705.

Materials of Concrete Work.

4742. The goodness of the practice of uniting coarse and fine gravel in concrete-work, is confirmed by the method pursued by the Romans in works in some sort analogous, as may be found in the following extract from a French tract, entitled, "*Recherches sur les Aquéducs de Lyon, par Mr.* DELORME, 1760." *Page* 32.

" C'est particuliérement à cette attention dans la main-d'œuvre que l'on doit " la durée de ces grandes constructions exposées depuis tant de siecles aux in- " jures de l'air & des frimats. Nos ouvriers ne veulent point se conformer à " cette excellent pratique, soit pour l'attention de mettre en mortier les joints " montants, soit pour garnir les vuides avec du petit moëllon en bain de mortier, " qu'ils remplissent au contraire à pierres seches par un épargne condamnable ; " se contentant de jeter du mortier sur la superfice. Comme il ne peut entrer " dans les interstices, ces pierres demeurent sans liaisons. Aussi nos édifices " par le défaut de la main-d'œuvre n'ont que peu de durée, quoique faits avec " d'aussi bons & même de meilleurs matériaux que ceux des anciens.

" L'usage du bon mortier contribuoit beaucoup à la solidité de leurs con- " structions. Il étoit fait avec de gros sable des riviers qui descendent des " montagnes, incomparablement meilleur que les sables fins, qui ne sont guere " propres que pour crépir ; comme celui du Rhône. Quand ils étoient obligés " d'employer du sable fin, ils en faisoient un mêlange avec de la brique pulvérisée ; " ce qu'ils observoient de même pour le sable trop gros. L'on voit que la chaux " n'y étoit point épargnée, & qu'elle étoit faite de bonnes pierres calcaires.

" J'ai reconnu par expérience qu'un tiers de chaux vive & deux tiers de gros " sable font toujours un excellent béton & un mortier gras ; & par la comparaison " que j'ai faite de leur mortier avec celui de mes expériences, il paroit qu'ils ont " observé la même regle. Il faut beaucoup moins de chaux quand on emploie du " sable fin ; c'est pourquoi nos ouvriers préférent le sable du Rhône à celui de la " Saône, qui est plus gros & infiniment meilleur.

" Le ciment employé dans les aqueducs étoit composé de briques pulvé- " risées pour les dernieres couches de leur enduit ; car dans l'épaisseur d'un " pouce & demi qu'ils mettoient sur les parois des murs, il étoit mêlé de morceaux " concassés, gros comme des pois. Dans celui de l'évier, de six pouces d'épaisseur, " l'on y voit des morceaux de briques gros comme des noix & comme des œufs. " Le mêlange en étoit fait avec de la chaux novellement éteint, sans autre com- " position ; à moins qu'il n'eût été délayé avec du vin ou du vinaigre, ce que l'on " n'y apperçoit pas. D'ailleurs ce que contribue le plus à faire de bon ciment, " comme de bon mortier, c'est que l'un & l'autre soient bien courroyés."

NOTES.

NOTE XI.

Arches of Brick-work.

4743. There is at present in use to a great extent a perverse method of constructing the largest arches, of separate rings of brick-work only half a brick thick each, which easily separate one from another by the least settlement, a number of most remarkable instances of which lately existed in the bridges over the Fleet-ditch, London, the abutments of which spread by the moistening effects of the water. If arches be in span only 5 or 6 feet, this method, as it allows of more bricks being placed near the extrados of an arch than at its intrados, is admissible; but in every case where the bricks of the several rings coincide, a bond course of heading bricks should be inserted in the work. Some excellent observations upon this subject are to be found in Mahan's American work on Civil Engineering, Second Edition, page 83. By sorting ordinary bricks so as to suit their accidental shapes and sizes to their several stations in the work, arches may in general be built with close joints and with proper bond.

t. t. t. Tie-bricks bonding the rings together.
f. f. f. Fractures which sometimes occur from the separate rings settling apart.
w. Spandril of work which sometimes settles away from the back of an arch, for the prevention of which, see § 4482.

THE

CONTENTS

OF THE

LONDON BUILDING-ACT,

ABSTRACTED AND ARRANGED ALPHABETICALLY, WITH REFERENCES TO THE SECTIONS OF IT.

The knowledge of this Act though principally of use to persons in the metropolis, is also of great interest to all others who possess property within the limits of its provisions.

CONTENTS

OF THE

LONDON BUILDING-ACT.

ING PARTIES "possessed of or entitled unto any part of the ground where-
" on a party-wall is intended to be built," may *require by writing*
ing *(any time before such Party-wall shall be begun to be built)*, to be
ne). erected in a proper, substantial and workmanlike manner, such and so many chimney-jambs, breasts, and flues of chimneys, in all such parts of every such party-wall as shall be by the parties giving such notice required, and may also require such recesses to be left in every such party-wall as are allowed by the Act; the performance of such work is to be taken as making use of such party-wall, and gives the builder thereof the right of recovering the expense thereof and of the proportion of the Party-wall attached thereto. B. a. § 30.

is not to lie against any person upon whose premises any fire shall accidentally begin. B. a. § 86.

or prosecution for *penalties* or *forfeitures* must be commenced within six months after forfeiture is incurred. B. a. § 99.

21 days' Notice of, must be given where the action is in respect of any thing done *in pursuance of the Statute*. B. a. § 100.

and must be commenced within three calendar months after commission of the fact, and tender of compensation may be made by the party offending. B. a. § 100.

PARLIAMENT (FORMER) relative to Buildings repealed. B. a. § 101.

T of legal correctness of Buildings, see District-surveyors.

ICE JURY. (See Ruinous buildings.)

or final judgment,

1st. may be made to the Quarter Sessions by any persons who think themselves aggrieved by any conviction, commitment, distress, order, or judgment of any magistrate under this Act. B. a. § 96.

[illegible], but those who intend to appeal are within two days after conviction, commitment, distress, order or judgment, to enter into recognizances to the party appealed against before such justice, with two sufficient securities to pay such costs as shall be awarded by the Sessions. B. a. § 97.

[illegible]. See Insurance Companies.

[illegible] of chimneys. (See Chimney-backs.)

[illegible], materials of. (See Copings.)

[illegible], materials of. (See Copings.)

[illegible]. (See Constables.)

[illegible]. (See Timber.)

[illegible] and other projections,

1st, are not to be made to project in front of any building of the 1st, 2nd, 3rd, or 4th rate, except copings, cornices, fascias, door-dressings and window-dressings, and open porticos, steps, or iron palisades, and except shop windows.

2dly. Stall-boards of shop-windows are not to extend more than 10 ins. in public ways 30 feet wide, nor more than 5 ins. in public ways of less width.

3dly. Cornices or coverings of shop-windows are not to project more than 18 ins. in public ways 30 feet wide, and not more than 13 ins. in public ways of less width. B. a. § 49.

4thly. No Bow-window or other projection is to be made to any building of the 1st, 2nd, 3rd, or 4th rate, unless the same and the columns and pilasters (if any) which support the same be built of the materials directed to be used in all external walls and inclosures. § 49.

5thly. No Bow-window or other projection made or built before the 24th of June, 1774, shall be rebuilt, except such as allowed by this Act, unless such projection was built at the same time as the building to which the same belongs, or unless such projection be within the original line of the public way. B. a. § 52.

[illegible]. (See Chimney-breasts.)

[illegible] and Story-posts. (See External inclosures.)

[illegible] liquors for sale, are within the limits of the Building-act constituted of the first rate or class of building. B. a. § 2.

[illegible] or London extends to the limits of the cities of London and Westminster, and other places within the limits of the Weekly Bills of Mortality, and the Parishes of St. Mary-le-Bone, Paddington, St. Pancras, and St. Luke, Chelsea. B. a. § 1.

[illegible] Buildings without the cities of London and Westminster and the Liberties thereof, while used by) are by the Building-act constituted of the 7th Rate. B. a. § 20.

CERTIFICATE of the proper erection of Buildings. (See District-surveyors.)

CERTIORARI, no order of any magistrate, or other proceeding under this Act is to be removable by, to any of the Courts at Westminster. B. a. § 95.

CHAPELS within the limits of the Building-act are constituted of the 1st rate or class of Building. B. a. § 2.

CHELSEA PARISH is included within the limits of the Building-act. B. a. § 1.

CHIMNEYS of adjoining premises. (See Adjoining parties.)

CHIMNEY-BACKS in Party-walls. B. a. § 29.

Cellar-story 13 ins. thick, Stories above 8½ } To the height of 12 ins. above the mantle.

CHIMNEY-BACKS of chimneys built back to back in Party-walls. B. a. § 29.

1st rate	cellar story 8½ ins. thick	from the centre of the wall.
	stories above 4¼ ins.	ditto.
2nd, 3rd, and 4th rates	cellar story 6½ ins.	ditto.
	stories above 4¼ ins.	ditto.

CHIMNEY-BACKS not in Party-walls. B. a. § 45.

1st rate	Cellar-story 13 ins. thick, stories above 8½ ins.	From the hearth to 12 ins. above the mantle; may be ½ brick thinner if against a wall.
2nd, 3rd, and 4th rates	each story 8½ ins.	

CHIMNEY-BREASTS are not to be supported on timber, but by arches of brick or stone, or by iron bars. B. a. § 45.

CHIMNEY-OPENINGS. (See Timber.)

CHURCHES within the limits of the Building-act are constituted of the 1st rate or class of building. B. a. § 2.

CHYMICAL WORKS for sale (buildings for) within the limits of the Building-act are constituted of the 1st rate or class of building. B. a. § 2.

CHURCH-WARDENS (*and Overseers in districts where there are no Church-wardens*),

(*Fire plugs, &c.*) 1st, Are at the expense of the parish or other district to make place and fix such and so many stop-blocks of wood with a wood plug, of such and so many fire-cocks, to go into each main or pipe, and to be placed at such distances in each and every street or place as such Church-wardens or Overseers shall direct, and are to fix marks upon the fronts of the houses over against or nearest to the places where they lie:

(*Keys, &c.*) And shall also keep an instrument or key in every such house, and a pipe for the water to come thereout.

The parish or other district shall keep in repair such stop-blocks and fire-cocks:

(*Repair of plugs, &c.*) The owners of the mains and pipes shall keep in repair the plugs, and shall also make good the stop-blocks and fire-cocks if they remove change or alter the mains or pipes. B. a. § 74.

(*Fire-engines, ladders, &c.*) 2dly, Are to keep in every parish a large fire-engine, and also a hand-engine and one leather pipe at the least, with a socket

of the same size as the plug or fire-cock, and a stand-cock or [illegible]-pipe, also at least one fire-ladder of one story, 1 ditto of two stories, and 1 ditto of three stories. B. a. § 75.

[illegible]. Neglecting the above, to be fined £10. half to the informer, and the remainder to the District-surveyor.

4thly, Are to pay rewards for the first turning on of the water, and for the arrival of the first three engines at any fire, (See Turncocks and *Engine-keepers*) B. a. § 76. but no such reward is to be paid without the approbation of one or more magistrate resident within the parish or other district, or if within the city of London, without the approbation of the alderman, or of the deputy or of two common-councilmen of the ward. B. a. § 77. (See Fire.)

5thly, With the consent of vestry or other public meeting, may for the performance of the several matters for the prevention of fire required of them under this Act, provide funds out of the poor-rate or by special rate. B. a. § 81.

Vestries may maintain more than one great engine or hand-engine in a parish. B. a. § 80. (See Ruinous buildings.)

[illegible] to have notice of the abodes of District-surveyors. (See District-surveyors.)

[illegible]. Affidavit of the legal erection of each building is to be filed with, by District-surveyors, upon payment of 1*s*. (See District-surveyors, 7thly.)

[illegible] projection of, next public ways. (See Bow-windows.)

[illegible] materials of. (See Copings.)

[illegible] of paving, and the commissioners of sewers of the city of London are not prejudiced in their powers by this Act. B. a. § 50.

[illegible] (See Appeal.)

[illegible] (See Party-walls.)

[illegible] under of. (See Action.)

[illegible] are upon notice to repair immediately to fires, and assist in extinguishing the same, cause the engines to be worked, prevent robbery, and assist the inhabitants in removing their goods. B. a. § 83.

[illegible] (See Appeal.)

[illegible] projection of, next public ways. (See Bow-windows.)

[illegible] fascias, window-dressings, porticos, balconies, balustrades, or other external decorations or projections to any building of the first second third or fourth rate, and every frontispiece to any building of the first rate shall be externally of brick, stone, burnt clay, or artificial stone, stucco, lead, or iron, except the cornices and dressings to shop-windows, and except such covered ways as may hereafter be made to any building, which covered ways shall not extend beyond the *original* line of the houses in the public ways, and which covered ways shall be covered with stone, lead, copper, slate, tile, or tin; and no covered way, nor the cornice or dressings to any shop-window, nor the roof of any such portico shall be higher than the under side of the sill of the one-pair windows of the building to which the same belongs. B. a. § 48. (See Water.)

COPPERS. (See Timbers.)

CORNER-POSTS. (See External Inclosures, 5thly.)

CORNICES projection of next public ways. (See Bow-windows.)
materials of. (See Copings.)

COSTS (securities for payment of). (See Appeal.)

COVERED WAYS. (See Copings.)

COURT-LEET. (See Ruinous buildings.)

CRANE-HOUSES on wharves and quays within the limits of the Building-act are constituted of the 7th rate. B. a. § 20.

DISTILLERIES of turpentine or of liquors for sale are, within the limits of the Building-act, constituted of the 1st rate or class of building. B. a. § 2. (See Turpentine.)

DISTINCT TENEMENTS, buildings of the 1st 2nd 3rd or 4th rate (except inns of Court, the Royal Exchange, Companies' halls, and warehouses and dwelling-houses let at rack rents of not more than £25. per annum, if they be divided on the ground story into distinct tenements, shall be considered as separate buildings, and shall be divided from each other by party-walls of the proper rate. B. a. § 55.

DISTRESS. (See Appeal.)

DISTRICT-SURVEYORS (*i. e. discreet persons, skilled in the art of building.*)

(*Appointment.*) 1st, Are to be appointed as surveyors or supervisors by and during the will and pleasure of the magistrates who are to assign to them their respective districts and swear them to the faithful performance of their office. B. a. § 62.

(*Abode.*) 2ndly, Are from time to time to leave notice in writing with the Clerk of the Peace of their usual abodes. B. a. § 62.

(*Notice to.*) 3rdly, Are to have notice from the workman or other person causing any building or wall to be built, 24 hours before the same is begun. B. a. § 63.

(*Fees.*) 4thly, Are to be paid by the master workman or other person causing the work to be done such sums as any two magistrates over their districts shall by writing under their hands appoint; not exceeding, (B. a. § 63.)

		New buildings.				Alterations or additions to old buildings.		
		£.	s.	d.		£.	s.	d.
1st rate	. .	3	10	0	...	1	15	0
2nd do.	...	3	3	0	...	1	10	0
3rd do.	...	2	10	0	...	1	5	0
4th do.	...	2	2	0	...	1	1	0
5th do.	...	1	10	0	...		15	0
6th do.	...	1	1	0	...		10	6
7th do.	...		10	6	...		5	0

(*Recovery of fees.*) On default of payment District-surveyors may recover their fees by distress against the parties liable for the same.

(*Penalties for neglect of notice.*) 5thly, are entitled to treble fees from all persons who shall begin to build or to cut into any party-wall without giving them 24 hours previous notice, and from persons who shall refuse to admit them at reasonable hours for viewing the work; every such offender is also to be subject to a penalty of £20. and the work if irregular is to be demolished or amended by order of the magistrates. B. a. § 64.

(*Information for breach of Act.*) 6thly, Are to give information to the magistrates as soon as convenient, of irregular buildings or walls, and if upon hearing of the case breach of the Act be proved, the magistrates are to cause such irregular buildings or walls to be demolished or amended. B. a. § 65.

(*Survey and certificate.*) 7thly, Are within 14 days after any building is covered in, or any wall is finished, or the cutting into any party-wall is made good, to be required by the master builder or other person who shall cause the work to be performed, to survey the same: if the surveyor of the district shall refuse or neglect or shall by illness or otherwise be prevented from surveying the work, then the same shall be surveyed by some other District-surveyor for the same city, county, or liberty: within fourteen days after surveying the work, the District-surveyor shall if it be correctly performed make affidavit thereof before a magistrate, which affidavit shall within ten days after the making thereof, be filed with the Clerk of the Peace, who is to be paid for the same 1*s.* and no more.

(*Survey, &c. to be made by other District-surveyor in case of neglect.*) (*District-surveyor's affidavit.*)

(*Builder, &c. to be fined for neglecting to have survey and affidavit made.*) The master workman or other person who shall neglect to have such survey made, or who shall neglect to have such affidavit made and filed within one month, shall forfeit £10. and a further sum of £10. for every month that the certificate shall not be made and filed. B. a. § 67.

(*District-surveyors' neglect of duty.*) 8thly, For wilful neglect of duty or behaving unfaithfully shall upon complaint be by the magistrates discharged and for ever afterwards be incapable of being appointed again under this Act. B. a. § 68. (See Church-wardens, 3rdly.)

DOOR-DRESSINGS, projection of. (See Bow-windows.)
materials of. (See Copings.)

DOOR-FRAMES. (See Flats.)

DORMERS. (See External walls and Inclosures, also *Flats*, also Party-walls, height of, 2dly.)

DWELLING-HOUSES only have their rates ascertained by extent on their ground-floors.

(B. a. § 2.) 1st rate if above 9 squares.
(B. a. § 5.) 2nd ... from 5 to 9 squares.
(B. a. § 8.) 3rd ... ... 3½ to 5 squares.
(B. a. § 11.) 4th ... not exceeding 3½ squares
(B. a. § 18.) 5th ... distant from 4 to 8 feet from any public way, and from 16 to 30 feet from any other building not in the same possession therewith, *and may be built of any dimensions whatever.*
(B. a. § 19.) 6th ... distant full 8 feet from any public way and full 30 feet from any other building not in the same possession therewith, *and may be built of any dimensions and of any materials whatever.*

YE-HOUSES within the limits of the Building-act are constituted of the 1st rate or class of building. B. a. § 2.

GINE-KEEPERS are to be rewarded according to the order in which they shall bring engines to a fire, with sums not exceeding 1st, 30*s*., 2nd, 20*s*., 3rd, 10*s*. (See *Churchwardens*, 4thly.) B. a. § 76.

XTERNAL INCLOSURES to 1st, 2nd, 3rd, 4th, or 5th rate buildings,

1st, Are to be of brick, stone, artificial stone, lead, copper, slate, tile, or iron, except piling, bridging and planking to foundations, and templets, chains, bond-timber, doors, sashes, window-shutters, and door and window-frames, and tiers of window-frames and door-frames to warehouses of the 1st, 2nd, 3rd, or 4th rate, and breast-summers, story-posts, and plates and stall-boards.

2ndly, Window-frames and door-frames are to be let 4 ins. at least into reveals; but tiers of door-cases and doors to warehouses, and breast-summers and story-posts on ground stories, are not required to be in reveals.

3rdly, No story-post or breast-summer is to be fixed more than 2 ins. deep in any party-wall, or in any front nearer than 7 ins. from the centre of the party-wall if two bricks thick, and 4½ ins. if thinner.

4thly, No other timber is to extend within 4 ins. of the external surface of an external wall.

5thly, Every corner-post supporting two fronts next public ways is to be of oak or stone and at least 12 ins. square. B. a. § 46.

XTERNAL WALLS (*thickness of, new*).

	1st Course of footings. *Top of footings to be 2 ins. below the upper surface of cellar paving and flooring-boards.*	From top of footings to under side of ground floor.	From under side of ground floor, to under side of one-pair floor.	From under side of one-pair floor, to the under side of the plate of the roof.	From plate of roof to the under side of the blocking-course or coping of the parapet.
XTE.	2½ Bricks, 9 ins. high.	2 Bricks.	2 Bricks.	1½ Brick.	1 Brick.
	Parts wholly of stone may be only 14 ins. thick.		*Above the ground floor parts wholly of stone may be only 9 ins. thick: and arched recesses may be made in brick-work, with backs 8½ ins. thick.*		
XTE.	2 Bricks, 9 ins. high.	1½ Brick.	1½ Brick.	1 Brick.	1 ditto.
			Above the ground floor parts wholly of stone may be only 9 ins. thick: and arched recesses may be made in brick-work with backs 8½ ins. thick.		
XTE.	2 Bricks, 6 ins. high.	1½ ditto.	1 Brick.	1 ditto.	1 ditto.
XTE. 2.	2 Bricks, 6 ins. high.	1½ ditto.	1 ditto.	1 ditto.	1 ditto.

EXTERNAL WALLS *and Inclosures* (OLD), § 51.

1st, May be repaired with materials of the same nature as the old work with the following exceptions.
2ndly, Roofs, flats, gutters, dormers, turrets, and lanthorn-lights, or other erections on the same, which are to be repaired with the materials herein specially directed for the same.
3rdly, But if such external walls and inclosures be taken down as low as to the breast-summer or one-pair floor, all the irregular parts thereof shall be taken down and be rebuilt according to the regulations of this Act.
4thly, No new Bow-window or other projection is to be allowed unless within the original line of the public way. § 52.

FASCIAS, projection of. (See Bow-windows.) Materials of. (See Copings.)

FEES. (See District-surveyors and Clerk of the Peace.)

FELL-MONGERS (Buildings without the cities of London and Westminster and the Liberties thereof, while used by) are by the Building-act constituted of the 7th rate. B. a. § 20.

FIFTH RATE or class of Buildings within the limits of the Building-act, (B. a. § 18), which may be built of any dimensions whatever.

See First Rate.

Dwelling-houses, warehouses, stables, and other buildings (*except those of the 7th rate, and except the 14 kinds of buildings which are constituted in all cases of the 1st rate.* B. a. §§ 2 and 20), which are distant from 4 to 8 feet from any public way, and are detached from 16 to 30 feet from any other building not in the same possession therewith; but if afterwards divided into distinct tenures without being separated from each other from 16 to 30 feet, the same are to be deemed public nuisances and shall be immediately taken down (B. a. § 58). For coverings of roofs, dormers, turrets, &c. see *Flats, &c.*

FINE. 1st, Not exceeding £10. may be imposed on the *sheriff* or *under-sheriff* or upon any *witness* making default of any matter before the Court. (See Witnesses.) B. a. § 37.
2ndly, For not giving notice to and for not admitting the district surveyor, and for not having buildings surveyed and certified by the district-surveyor. (See District-surveyor.)
3rdly, Upon workmen for infringement of the regulations of the Act. (See Workmen.)
4thly, For infringement of the Act relative to chimneys. (See *Flues.*)
5thly, For illegal distillation of turpentine.
6thly, Upon servants for the firing of buildings through negligence. (See Servants.)

FIRE (IF) OCCUR IN ANY CHIMNEY, the occupant of the room to which the same belongs is to repay the Churchwardens or Overseers the rewards paid to the Turncock and Engine-keepers, or such part thereof as the Magistrates shall under their hand and seal direct, and in default of payment within 14 days after demand the same may be recovered by distress of the goods of the party making default, or on the goods found in the apartment to which such chimney belongs. B. a. § 78.

FIRE-COCKS. (See Churchwardens.)

ENGINES. (See Churchwardens.)

LADDERS. (See Churchwardens.)

RATE or Class of Buildings within the Limits of the Building-act. B. a. § 2.

Of what dimensions soever or wherever situate. B. a. §§ 2, 18, 19.

1. Churches.
2. Chapels.
3. Meeting-houses.
4. Distilleries of Liquors for sale.
5. Breweries of ditto.
6. Soap-houses.
7. Tallow-melting ditto.
8. Dye-houses.
9. Buildings for boiling or distilling turpentine.
10. Brass-foundries.
11. Iron-foundries.
12. Sugar-refineries.
13. Glass-houses.
14. Buildings for Chymical works for sale.
15. Dwelling-houses exceeding on their ground stories 9 squares of 100 superficial feet.
16. ALL OTHER BUILDINGS (except those of the 5th, 6th, or 7th rate) which exceed three clear stories above ground, exclusive of any rooms in their roofs, or which shall be 31 feet high above ground at either of the fronts to the top of the blocking-course or coping of the parapet; this description of buildings may be made of any dimensions whatsoever on their Plans, with the exception of warehouses which are confined to 35 squares of building, and stables which are confined to 25 squares of building: but ranges of warehouses and stables may respectively communicate together by wrought-iron doors in stone door-cases. B. a. §§ 53, 54.

er build- om 4 to from the way and ed from 30 feet ny other igs not e same sion are ie 5th ad other igs 8 ft. he pub- y, and rom any uildings he same sion are ith rate. § 18, 19. a. § 20 rate.

, gutters, and roofs to buildings of the 1st, 2nd, 3rd, 4th, and 5th rate, and every turret, dormer, lanthorn-light, and other erection placed in the flat or roof of any such building, and every external part of any such gutter, roof, turret, dormer, and lanthorn, which shall be ripped or uncovered, shall be covered with glass, copper, lead, tin, slate, tile, or artificial stone, except the doors, door-frames, windows, and window-frames thereof. B. a. § 47. (See External walls and inclosures, old.)

ds of d pro- there-

1st, (*Backs of*) opposite each other in a Party-wall are to be 2 ins. from the centre of the wall. B. a. § 29.

2ndly, (*Breasts of*) are to be of brick or stone at least 8½ ins. thick in every cellar-story, and 4 ins. thick in every other story. B. a. § 29.

3rdly, (*Withs or partitions of*) are to be of brick or stone ½ brick thick. B. a. § 29.

4thly, (*Breasts, backs, and withs of*) are to be rendered or pargeted within and without except the outsides thereof next any vacant ground, in which case the back of every such chimney

and flue next such vacant ground shall be marked, and except in a fore-front, back-front, or side-front of any building not likely hereafter to be built against, and every back of every such chimney and flue so being against such vacant ground, shall be rendered or pargeted as soon as any building shall be erected to any such party-wall. B. a. § 29.

By the 4th and 5th of William IV. cap. 35. § 18. the following regulations with regard to flues were enacted;

Materials and Construction of Chimneys and Flues particularly directed.

And whereas it is expedient that for the better Security from Accidents by Fire or otherwise an improved Construction of Chimneys and Flues should hereafter be adopted; be it therefore further enacted, That all Withs and Partitions between any Chimney or Flue which at any Time after the passing of this Act shall be built or rebuilt shall be of Brick or Stone, and at least equal to Half a Brick in Thickness; and every Breast, Back, and With or Partition of any Chimney or Flue, hereafter to be built or rebuilt, shall be built of sound Materials, and the Joints of the Work well filled in with good Mortar or Cement, and rendered or stuccoed within; and also that every Chimney or Flue hereafter to be built or rebuilt in any Wall, or of greater Length than Four Feet out of any Wall, not being a circular Chimney or Flue of Twelve Inches in Diameter, shall be in every section of the same not less than Fourteen Inches by Nine Inches; and no Chimney or Flue shall be constructed with any Angle therein which shall be less obtuse than an Angle of One hundred and twenty Degrees, and every salient or projecting Angle in any Chimney or Flue shall be rounded off Four Inches at the least; upon pain of Forfeiture, by every Master Builder or other Master Workman who shall make or cause to be made such Chimney or Flue, of the Sum of One hundred Pounds, to be recovered with full Cost of Suit, by any Person who shall sue for the same in any of His Majesty's Courts of Record at Westminster: Provided nevertheless, and be it enacted, That nothing in this Clause contained shall be construed to prevent Chimneys or Flues being built at Angles with each other of Ninety Degrees and more, such Chimneys or Flues having therein proper Doors or Openings not less than Six Inches square.

Regulations as to Angles of Flues.

Fine.

Chimneys of a certain Construction may be built at Angles.

These regulations refer to the whole of the united kingdom of Great Britain and Ireland, and are to continue in force till January 1st, 1840, and from thence till the end of the then next session of Parliament.

(See Timber.)

FOOTINGS may be cut off from a party-wall in order to build another wall against the same. B. a. § 28. (See Party-walls.)

FORM, no distress made under this Act is to be unlawful for want of, B. a. § 87, and no recovery in any action on account of irregular proceedings under this Act is to be had if tender of sufficient amends be made. B. a. § 88.

FRONTISPIECES, materials of. (See Copings.)

FOUNDATIONS of Chimneys. (See Timber-work.)

FOUNDRIES of Brass or Iron within the limits of the Building-act are constituted of the 1st rate or class of Building. B. a. § 2.

FOURTH RATE or class of Buildings within the limits of the Building-act. B. a. § 11.

1st, Dwelling-houses not on their ground stories exceeding 3½ squares of 100 superficial feet.

2ndly, Warehouses, stables and other Buildings (not of the 1st, 5th, 6th, or 7th rate) not more than one story high above ground exclusive of any rooms in the roof thereof, or which shall not be more than 13 feet high from the ground before either of the fronts thereof to the top of the blocking-course or coping of the parapet. This description of buildings may be made of any dimensions whatsoever on their plans, with the exception of warehouses which are confined to 35 squares of building, and stables which are confined to 25 squares of building: but different ranges of warehouses and stables may respectively communicate together by wrought-iron doors and stone door-cases. B. a. §§ 53, 54.

See 1st rate for 14 kinds of Buildings excepted, and B. a. § 2.

Other buildings from 4 to 8 feet from the public way and detached from 16 to 30 feet from any other buildings not in the same possession are of the 5th rate, and other buildings 8 feet from the public way and 30 feet from any other building not in the same possession are of the 6th rate. B. a. §§ 18, 19, and B. a. § 20 for 7th rate.

FUNNELS FOR SMOKE OR STEAM, of iron, tin, copper or other materials are not to be fixed next any Public-way to any Building of the 1st, 2nd, 3rd, or 4th rate, nor shall any such funnel be fixed on the inside of any building within 14 ins. of any combustible material, and no brick funnel is to extend on the outside of the front of any building beyond the general line of the houses next any public way. B. a. § 59.

FURNACES. (See Timber or Wood-work.)

GLASS-HOUSES are, within the limits of the Building-act, constituted of the 1st rate or class of Building. B. a. § 2.

GLUE-MAKERS (Buildings without the cities of London and Westminster and the liberties thereof, while used by) are by the Building-act constituted of the 7th rate. B. a. § 20.

GUTTERS. (See *External walls and inclosures* (*old*) also *Flats*, also *Water*.)

HEARTHS. 1st, Are not to have any timber laid in any wall within 18 ins. of their surface. B. a. § 45.

2ndly, Are to be laid wholly on brick or stone, except when in a cellar or ground-story bedded on the solid earth. B. a. § 45. (See *Slabs*.)

HOARD. (See Ruinous buildings.)

IMPROVED RENT, parties entitled to, liable for the expense of Party-walls. (See *Reimbursement*, 1st.)

INCLOSURES. (See External inclosures and Internal ditto.)

INQUEST. (See Ruinous buildings.)

INNS OF COURT. (See *Party-arches*, 2ndly.)

INSURANCE COMPANIES are upon request of any person interested in or entitled to any building which may be burnt, or upon suspicion of *arson* are to lay out the Insurance-money as far as the same will go in rein-

[illegible] the damage, unless the parties claiming the money shall [illegible] 10 days after the adjustment of the claim give sufficient [illegible] to the Directors of the Company that the money shall be laid out as aforesaid, or unless the money shall be disposed of among the contending parties to the satisfaction of the Directors. B. a. § 83.

[illegible] and floors. (See Party-arches.)

[illegible] to buildings of the 1st, 2nd, 3rd, or 4th rate when such [illegible] shall be in separate occupations shall be of brick or stone, or artificial stone, or stucco, or of brick and stone, or artificial stone or stucco together. B. a. § 16.

[illegible]

1st, New erected or altered according to Act, are to be deemed common nuisances, and builders and owners thereof after conviction by the oaths of two or more credible witnesses before two or more justices shall enter into recognizances for abating such nuisances or for making amendment, in such sums and within such convenient times as the justices shall appoint, and upon default be committed to the common gaol.

2dly, Conviction is to be had within three months after any such building is finished. B. a. § 60.

3dly, Justices may order such irregular buildings to be abated or taken down, and may sell the materials thereof, to pay the attendant expenses, and if such sale be not sufficient the owner is to make good the deficiency as directed in the case of ruinous buildings. B. a. § 61.

[illegible] (See Timber or Wood work, 3rdly.)

[illegible] (See Appeal.)

[illegible] (See External walls and inclosures, see also *Flats*.)

[illegible] Buildings without the cities of London and Westminster and the liberties thereof, while used by) are by the Building-act constituted of the 7th rate. B. a. § 20.

[illegible] (See *Action*.)

[illegible] Building-act. (See Building-act.)

[illegible] (See Appeal.)

[illegible] (Party-walls not to be). (See Party-walls, cutting into.)

[illegible] (See Timber or Wood work, 3dly.)

[illegible] parish is included within the limits of the Building-act. B. a. § 1.

[illegible] (See External inclosures, see External walls and inclosures (old), see Copings.)

[illegible] ALDERMEN of the city of London, the powers of this Act vested in the court of may be executed by the court of mayor and aldermen to be holden in the outer chamber of the Guildhall, according to the custom of the said city. B. a. § 35.

TING-HOUSES within the limits of the Building Act are constituted of the 1st rate or class of building. B. a. § 2.

ICE. (See District-surveyors, 3dly; also Party-arches, &c. 3dly; also Party-walls (rebuilding of, 1st); also Party-walls condemnable for insufficiency of thickness.)

ICE. (See *Action.*)

ICE of their abode to be given by District-surveyors. (See District-surveyors.)

ICE. (See Ruinous buildings.)

SANCES, irregular buildings are to be accounted as. (See Irregular buildings.)

OLETE sections of the Act §§ 89, 90, 91, 92, 93, 94, relative to prosecutions for buildings irregular at the passing of the Act.

and other materials (Boiling and mixing of) for *paying* ships, barges, boats, or masts, persons engaged in building or repairing ships, barges, boats or other vessels near the river Thames, are not to be restrained from. B. a. § 73.
By the 25th Geo. III. cap. 77. § 2. this exception is extended to all England.

(See Turpentine.)

CLOTH PAINTERS (Buildings without the cities of London and Westminster and the liberties thereof, while used by) are by the Building-act constituted of the 7th rate. B. a. § 20.

ER. (See Appeal.)
(See Certiorari.)

SINAL LINE of houses, regulations relative to building to. (See Copings, see also External walls and inclosures.

NS. (See Timber.)

RSEERS. (See Church-wardens.)

ACES AND BUILDINGS in the possession of or for the use or service of the sovereign are exempt from the restrictions of the Building-act. B. a. § 69.

ISADES. (See *Bow-windows.*)

CRAS PARISH is included within the limits of the Building-act. B. a. § 1.

ER-MAKERS (Buildings without the cities of London and Westminster and the liberties thereof, while used by) are by the Building-act constituted of the 7th rate. B. a. § 20.

ICHMENT-MAKERS (Buildings without the cities of London and Westminster and the liberties thereof, while used by) are by the Building-act constituted of the 7th rate. B. a. § 20.

Party-walls (as well as party-walls.) B. a. § 31.

(Intermixed property.)

1st, Are to be built between the intermixed rooms and floors of the properties of different owners, and over such public ways as such buildings project over, viz.

13 ins. thick to the 1st and 2nd rates.
8½ ditto 3rd and 4th

(Inns of Court.)

2ndly, But chambers of Inns of Court which adjoin to the same staircase are not required to be separated by party-walls and party-arches. B. a. § 32.

(Proceedings for subdivision of intermixed properties.)

3dly, When no party-walls and party-arches can be built upon proper foundations between houses and other buildings, over public ways, or having rooms or floors the property of different persons, lying intermixed, without pulling down such houses or buildings, and laying parts of each to the others of such houses or buildings, and the parties interested therein will not or cannot through disability join in building such party-walls or party-arches as aforesaid, any owner of any such building shall give 14 days' notice in the manner stated in the Act, of intention to apply to the court of Mayor and Aldermen of the city of London, or the other Justices of Peace as the case may require, to obtain the judgment of the court touching the rebuilding of such building, party-wall, or party-arch, and for ascertaining the site of such party-wall or the situation of any party-arches to be built; and to impannel a jury to view the premises and to determine by their verdict in the matter, and to ascertain the quantity of the soil or ground, or the parts of the premises to be laid to or be taken from the house of the persons desirous of rebuilding, and award what compensation if any should be made and paid by either or any of the said parties, "in difference" to the other, in lieu of lessening either of the buildings, and award the proportion of the expense of building such party-wall and party-arch to be paid "in difference" to the person or persons so rebuilding, and award to either party such costs as they shall deem reasonable. B. a. § 33.

(For rebuilding of party-walls and party-arches, and Party-walls.)

(Pulling down.)

After 14 days from obtaining such judgment and payment or tender of the money awarded (if any), the party who has obtained such judgment may pull down his her or their building and rebuild the same in the manner so ascertained, and in the presence of a constable or headborough or other officer of the peace enter upon the site so ascertained for a party-wall or party-arch, and into the house or other building (if any) adjoining thereto, between 6 in the morning and 7 in the afternoon, and may remove to some other part of the premises, or if there be not sufficient room thereon, may remove to any other place, any goods, furniture, shelves or other things obstructing the work or the pulling down any wall partition or other thing necessary to be pulled down and removed in order thereto, and the workmen are to have free access the usual times of working for the performance of the work and for shoring up the building so broken into: and a penalty of £10. is to be paid by any person obstructing the workmen or wilfully damaging the work. B. a. § 33.

(Recovery of expenses of building party-walls, party-arches, &c. between adjoining properties.)

Within ten days after any such party-wall or party-arch is built, the party who shall have built the same, is to leave a true account in writing of the expense of building the same, with the party or parties so awarded by the jury as aforesaid, to contribute to the expense thereof, to be paid within 21 days after demand; and in case the same be not paid, the tenant for the time of the building so chargeable may pay the same

and deduct the money so paid out of the next rent, or the same may be recovered by action with double costs of suit. B. a. § 34.

PARTY-FENCE-WALLS,

1st, May be raised by and at the expense of either party. B. a. § 43.

2ndly, Not to become party-walls unless built as party-walls suitable for the rates of the buildings for which they are desired to serve. B. a. § 43.

3rdly, If insufficient, or if there be only wooden fencing, the proprietors or occupiers of either of the adjoining premises may at their own expense take them down and erect new party-walls in lieu thereof, making good all damage caused thereby: but no new party-wall so built is to extend upon the adjoining ground more than 7 ins. from the centre of the former fence-wall or fence, and no alteration is to be thereby made in the ownership of the *soil under* such party-wall, such wall is not to be made use of by the adjoining party except as a party-fence-wall unless the same be paid for as stated in B. a. § 44. See Party-walls, rebuilding of.

PARTY-PARTITIONS,

1st, May remain till one of the adjoining houses is rebuilt, or till ⅔ of one of the fronts thereof be taken down to the one-pair floor, or till condemned pursuant to the directions concerning ruinous or defective party-walls or party-partitions. B. a. § 40.

2ndly, When two of them exist together side by side between buildings, and wooden party-fences, may for building new party-walls in lieu thereof be removed with any walls under or over the same, after 3 months' notice in the same manner as in cases of intermixed property, for which see *Party-arches*. B. a. § 40.

PARTY-WALLS (thickness of new).

§§ 4 and 15.	1st RATE, and to 2nd, 3rd, or 4th rate houses when *above* 4 stories high from foundation, exclusive of rooms in roof.	1st Course of footings. *Top of footings to be not less than 2 ins. below the upper surface of the cellar paving and flooring-boards.* The footings may be cut off from a party-wall in order to admit of another wall against the same. B. a. § 28.	From top of footings to under side of ground-floor.	From under side of ground floor to under side of two-pair floor.	From under side of two-pair floor to under side of floor of rooms in roof.	From thence to top of wall.
		3½ Bricks 12 ins. high.	2½ Bricks.	2 Bricks.	2 Bricks.	1½ Brick.
§ 7.	2nd RATE.	3½ Bricks 9 ins. high.	2½ ditto.	2 ditto.	1½ ditto.	1½ ditto.
§§ 10 and 15.	3rd RATE, and to 4th rate houses, when four stories high from foundation exclusive of rooms in roof.	3 Bricks 9 ins. high	2 ditto.	1½ ditto.	1½ ditto.	1½ ditto.
§ 13.	4th RATE.	2 Bricks 9 ins. high	1½ ditto.	1 ditto.		1 ditto.

§ 15. Houses of the 2nd or 3rd, or 4th rate with basement stories and square three-pair stories require Party-walls of the 1st rate. (See § 15.)

Houses of the 4th rate with basement stories and square two-pair stories require party-walls of the 3rd rate.

Houses of the 4th rate without basements and with square two-pair stories require party-walls only of the 4th rate.

Houses of the 4th rate without basements and with square three-pair stories require party-walls of the 3rd rate.

Houses of the 4th rate with basements and square three-pair stories require party-walls of the 1st rate.

PARTY-WALLS,

(materials of)

1st, With the chimneys and chimney-shafts are to be wholly of good sound brick or stone, or of good sound brick and stone together, except such timber, wood, lead, or iron-work as may be laid therein as hereafter stated, and except such piling, bridging, or planking as may be necessary for the foundation thereof. B. a. § 14.

2ndly, To be topped or coped with stone, tile, or brick. B. a. § 14.

3rdly, To be half on the site of each of the buildings to which the same adjoin, and the first builder may for that purpose enter upon the ground adjoining. B. a. § 14.

(See Timber.)

PARTY-WALLS, (new.)

(rate.)

1st, Are to be as required by the building of the highest rate adjoining thereto. B. a. § 42.

2ndly, If four stories high from the foundation, but exclusive of any rooms in the roof, are to be of the 3rd rate to buildings of the 4th rate, and if a story higher, are to be of the 1st rate, whatever may be the rate of the houses adjoining thereto. B. a. § 15.

PARTY-WALLS (old).

(raising of.)

1st, Are not to be *raised* after the buildings adjoining thereto are complete unless the same when raised be of the full thickness such party-walls are of, in the story next under the roof of the highest adjoining building. B. a. § 42.

2ndly, Are not to be *raised* unless the same can be done with safety to such party-walls, and to the adjoining buildings.

3rdly, Which when raised will be of the legal materials, heights, and thicknesses, and which can be with safety raised, may, together with the chimney-shafts belonging thereto, be raised to any height by and at the expense of the proprietor or occupier of any building to which the same belong: and if the other parties afterwards make use of such additional work, they thereby become liable for a proportionate part of the expense thereof. B. a. § 42.

PARTY-WALLS (*new*).

(Price of.)

1st, Are to be estimated against adjoining parties at the rate of

7*l.* 15*s.* per rod, with a deduction of 1*l.* 8*s.* per rod for the old materials of such part of any old wall or arch, and with a deduction of 2*d.* per cubic foot for the materials of any old timber partition which belonged to such adjoining parties.

ut for.) 2ndly, Within ten days after a party-wall or party-arch is built, or so soon after as conveniently may be, such first builder is to leave at such adjoining building a true account of the number of rods therein for which the owner of such adjoining building or ground shall be liable to pay, and of the deduction for old materials, and for shoring and other expenses as allowable.

ery of ex-nse of.) 3rdly, It shall be lawful for the tenant or occupier of the adjoining building or ground to pay the account and to deduct the same from the rent; and if the amount be not paid within twenty-one days after demand, the same may be recovered by action with full costs of suit, and if the plaintiff give before action three months' notice in writing to the defendant, and annex to such notice the bill and particulars of the charges, and recover the whole sum, such plaintiff shall also be entitled to double costs. B. a. § 41. See Reimbursement.

TY-WALLS (*new*) to any building of the 1st, 2nd, 3rd, or 4th rate are not to have any recesses therein, except for chimneys, flues, girders, beams, and other timbers, or for the ends of walls or piers as herein directed. B. a. § 26.

ses in.)

TY-WALLS (*new*).

1st, Are to be carried 1 ft. 6 ins. at the least above the roof of the highest building which gables against or adjoins to any such party-wall, measured at a right angle from the back of the rafters, and shall be carried 12 ins. above any gutter adjoining to such party-wall: but for 2 ft. 6 ins. back from the front of a building the party-wall may be less than 12 ins. above the gutter if it would otherwise exceed the height of the blocking-course. B. a. § 26.

t of.)

dormers.) 2ndly, Are to be extended 2 ft. wider than, and to the full height of any dormer or other erection which shall be fixed in the flat or roof of any building within 4 feet of any party-wall. B. a. § 26.

TY-WALLS, PARTY-ARCHES, or party-fence-walls require the following proceedings to be observed, if they need to be repaired or rebuilt from defect or from one or more of the buildings attached thereto being rebuilt, and if the adjoining parties will not or cannot agree relative thereto.

ilding and of.)

e.) 1st, The "owner" who shall think it necessary to repair, pull down, or rebuild the same is to give *three months'* notice in writing to the owner if he be known and can be met with, or if such owner be under coverture, to her husband, or if an infant, idiot, or lunatic, to the guardian, trustee, or committee, or otherwise to the occupier, of the adjoining premises, or other person as aforesaid, or by leaving the same at his, her, or their last or usual place of abode, or if such premises be unoccupied, by fixing a copy of such notice on the door of such last mentioned house or building. B. a. § 38.

of notice.) 2ndly, The notice must be in the form given in the Act, § 38.

edings of e receiving .) 3rdly, The party receiving notice is to appoint two surveyors or

able workmen, to meet at the time and place appointed in the notice, the two others mentioned in the notice. § 38.

(certificate.) 4thly, The four surveyors or able workmen are to certify after view whether the party-wall, party-arch, or party-fence-wall or any part thereof ought to be repaired or pulled down and rebuilt. § 38.

(default by parties receiving notice.) 5thly, If no two surveyors or able workmen meet those mentioned in the notice, then within six days after the time first appointed, those mentioned in the notice are to meet two others also to be appointed by the party giving the notice, and are then to certify to the court in the matter. § 38.

(further proceedings if certificate be not signed.) 6thly, If the major part of them do not sign the certificate within one month after the appointment, the magistrates are to appoint a fifth, and the five or the major part of them are to meet, six days' previous notice being given to them, and are to view and certify accordingly.

(certificate to be filed with Clerk of the Peace.) 7thly, Within three days after such certificate has been given, a copy of the same is to be delivered to the owner or occupier, or left at the adjoining building, or is to be fixed on the door thereof, and such certificate is to be immediately filed with the Clerk of the Peace. § 38.

(appeal.) 8thly, If such last mentioned owner or occupier think fit he may appeal against such certificate to the next general or quarter sessions, when the Justices shall summon before them one or more of those who signed the certificate, and shall make such order as they shall think fit, which order shall be final, and without further appeal.

(commencement of work.) 9thly, Upon default of appeal, or if upon appeal no order to the contrary be given, the work may proceed within 14 days from the delivery of the copy of the certificate, and after the determination of such appeal. B. a. § 38.

PARTY-WALLS (*old*) to buildings of the 1st, 2nd, or 3rd rate not more than 13 ins. thick in the basement story and 8½ ins. thick from thence to the coping thereof, may be pulled down by any owner desirous of rebuilding his building, after giving notice in writing to the owner or occupier of the next building of his intention in three months to pull down such party-wall and to build a new party-wall, after the expiration of which three months, the work may be performed, and wainscot, shelves, furniture, or other things may be removed and shoring performed as in § 33. B. a. § 39.

(condemnable for insufficiency of thickness upon notice only.)

PARTY-WALLS (*old*) 2 bricks thick to the under side of the ground floor, and 1½ brick thick from thence upwards built before the 24th of June, 1774, not according to the new Act, may if sound remain till both the buildings adjoining thereto are rebuilt, although buildings of the 1st and 2nd rates and party-walls above four stories high would otherwise require new party-walls of greater substance. B. a. § 23.

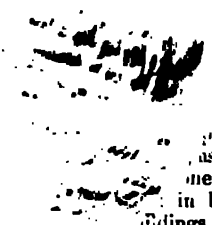
(not condemnable.)

PARTY-WALLS of buildings erected before 24th June, 1774, become subject to the regulation of the Act, if the fore-front and back-front be rebuilt as low as the breast-summer or one-pair floor within five years of each other. B. a. § 45.

(subject to restrictions of Act upon rebuilding fronts.)

PARTY-WALLS (old) timbers lying through them are to be cut off so as to leave full

work beyond such timbers, and if the owners will such party-walls are to be adjudged as ruinous.



no openings are to be made in, except for communica-
ne stack of warehouses to another and from one stable-
another, and except such passages or ways on the ground
assengers, cattle, or carriages, as may be necessary, all
assages are to be arched over with brick or stone, or brick
ne together, throughout of the thickness of 13 ins. at the
in buildings of the 1st or 2nd rate, and 8½ ins. thick in
dings of the 3rd or 4th rate: and if there be any cellar or
cuity under any such passages, the same kind of arched work
to be carried over such cellar or vacuity. B. a. § 26.

(New or old) are not to be maimed for any purpose whatever, but *may be cut into for the following purposes.* B. a. § 28.

1st, When a front or back wall is rebuilt, a break for the insertion thereof may be cut not more than 9 ins. deep from the external face of such wall and to the centre of the party-wall.

2ndly, 14 ins. deep from the external faces of external walls, and 4 ins. wide on the basement story, and 2 ins. wide on the ground story for the insertion of breast-summers and story-posts.

3rdly, For tailing in stone steps or stone landings, or for timbers for bearers to wooden stairs: but no such timber is to be carried within 8½ ins. from any flue or from any timber of the adjoining house or within 4 ins. from the internal finishings of such adjoining house.

4thly, For laying thereinto stone corbeilles for the support of chimney-jambs, girders, beams, purlins, binding or trimming-joists or other principal timbers.

5thly, Perpendicular recesses not within 10 feet of each other and not more than 15 ins. wide and 4 ins. deep, may be cut in party-walls which are not less than 13 ins. thick, for the insertion of walls and piers.

PARTY-WALLS, the footings of, may be cut from one side of, for admitting other walls close thereto if adjoining buildings be rebuilt. B. a. § 28.

Footings on one side of, may be cut off.

PARTY-WALLS when cut into for any purpose shall immediately have every injury caused thereto, made good, and well and effectually pinned up with brick, stone, slate, tile, or iron, bedded in mortar, by the party causing the damage. B. a. § 28.

(Repair of injury to.)

——— Not to be cut into for any purpose aforesaid if the same will injure displace or endanger the timbers, chimneys, flues or other internal finishings of the adjoining buildings. B. a. § 28.

(Restraint from cutting into.)

PAVING. (See Commissioners of.)

PENALTIES. (See Action for.)

PILASTERS next public ways. (See Bow-windows.)

PIPES. (See Water.)

(See Turnpike.)

(See Church-wardens.)

(See Bow-windows.)

from the fronts of buildings, (see *Bow-windows*,) also External walls and inclosures (*old*).

(this Act rendered so. B. a. § 102.)

projections next. (See Bow-windows; also Funnels.)

Passages through buildings. (See Party-walls, openings in.)

Sessions. (See Appeal.)

of buildings are constituted seven in number within the limits of the Building Act. B. a. § 1. Of dwelling-houses to be ascertained by admeasurement on the level of the floor of the principal entrance to such houses, and to include only such parts of the party-walls as belong to such dwelling-houses. B. a. § 17. And offices detached or connected only by a fence or fence-wall, and also covered passages open on one or both sides are not to be included in the admeasurement. B. a. § 22.

taining fire-engines, fire-ladders and fire-plugs, and for rewarding turn-cocks and engine-keepers. (See Church-wardens.)

(See Appeal.)

to the party who builds a party-wall or party-arch,

1st, Is to be made by "*the owner or owners who shall be entitled to the improved rent of the adjoining building or ground, and who shall at any time make use*" of the same.

2dly, payment cannot be recovered for more than half the expense of building a party-wall or party-arch, although the claimant's building be of the lesser rate:

3dly, The claimant cannot recover for more than such part of the wall as is actually used:

4thly, And if the claimant's buildings be of the superior rate, he can only recover for a moiety of the thickness of a party-wall or party-arch suitable for the rate of the adjoining building.

5thly, till a party-wall or party-arch is paid for by the adjoining party, the sole property thereof, and of the soil whereon the party-wall stands is vested in the party at whose expense the same was built.

6thly, Repayment for a portion of a party-wall built next vacant ground becomes due when the party-wall is first cut into or made use of.

7thly, Repayment for a portion of a party-wall or party-arch built adjoining to an existing building becomes due so soon as the same is finished, together with a proportionate part of all other expenses which shall be necessary to pulling down the old party-wall, or timber or wood partition, and the whole of all the reasonable expenses of shoring up such adjoining building and of

removing any goods, furniture, or other things, and of pulling down any wainscot or partitions, and also all such costs as may have been awarded by the court, but not any part of the expense of pulling down and clearing away any old party-wall, or party-arch, or old partition. See Party-walls, price of.

REINSTATEMENT of buildings burnt. (See Insurance Companies.)

REPEALED *(Acts of Parliament relative to buildings)*. B. a. § 101.

REVEALS of windows and doors. (See External Inclosures.)

REWARDS to Turn-cocks and Engine-keepers. (*See Church-wardens*, 4thly ; also *Fire*.)

ROOFS, coverings of. (See External walls and inclosures (old) ; see also Flats.)

RUINOUS BUILDINGS presented as such, by an inquest or grand jury in London, or an annoyance jury within the city and liberty of Westminster,
(Presentation of.) or by the jury sworn at the Court Leet held by the sheriff in his turn for any hundred or place, or any other jury or inquest sworn within the limits of the Building-act. B. a. § 70.

(*Hoarding.*) 1st, *shall* with all convenient speed after notice thereof, *be hoarded in for the safety* of passengers, by the court of Mayor and Aldermen in the city, and the Church-wardens and Overseers of the poor in other places, who shall also

(*Notice to owners, &c.*) 2ndly, cause *notice* in writing to be given to the owner or other persons interested therein, if to be met with, and if not, to cause such notice in writing to be affixed to or upon the door or other notorious part of such building, within 14 days to *repair or pull down* such building as the case may require.

(*In default of repair, &c.*) 3rdly, If the repairing or pulling down of such condemned building be not commenced within 14 days after notice, the Mayor or Aldermen, or the Church-wardens and Overseers, out of their funds, are with all convenient speed to cause the building or so much thereof as may be necessary for the safety of passengers, to be taken down, and secured, and to sell such of the materials as may be judged necessary for payment of the hoard and other expenses. B. a. § 70.

(*Disposal of overplus after sale of materials.*) 4thly, Any overplus from the sale of materials is to be paid over to the owner of the premises upon demand within 6 years afterwards. B. a. §§ 70, 71.

(*In case of deficiency after sale of materials.*) 5thly, If the sale of the materials be insufficient, the owner is to pay the difference, but if such owner cannot be found or do not fully pay the amount, any tenant of the premises is to pay the same and deduct the sum from the rent ; and if the tenant neglect or refuse payment, the same is to be levied by distress upon such tenant's goods. B. a. § 71.

SECOND RATE or class of buildings within the limits of the Building-act. B. a. § 5.

See 1st rate for 14 kinds of buildings excepted. 1st, Dwelling houses from 5 to 9 squares of 100 superficial feet on their ground stories.

Other buildings from 4 to 8 feet from the public way, and detached from 16 to 30 feet from any other 2ndly, Other buildings (not of the 1st 5th 6th or 7th rate,) which contain more than 2 clear stories above ground exclusive of any rooms in the roofs thereof, and not more than 3 stories, or which are from 22 feet to 31 feet high from the ground before either of the fronts thereof to the top of the blocking-course or coping

buildings not in the same possession are of the 5th rate; and other buildings 8 feet from the public way and 30 feet from any other building not in the same possession are of the 6th rate. B. a. §§ 18, 19, and see B. a. § 20 for 7th rate.

of the parapet: this description of buildings may be made of any dimensions whatsoever on their plans, with the exception of warehouses which are confined to 35 squares of building, and stables which are confined to 25 squares of building: but ranges of warehouses and stables may respectively communicate together by wrought-iron doors in stone door-cases. B. a. §§ 53, 54.

SECURITIES for payment of costs. (See *Appeal.*)

SECURITY for laying out insurance money. (See Insurance Companies.)

SEPARATE OCCUPATION, subdivision of buildings in. (See Internal Inclosures.)

SERVANTS who shall cause buildings to be fired through negligence or carelessness, shall be fined £100 to be distributed by the Church-wardens and Overseers among the sufferers, and in default of payment be committed to gaol for 18 months to be kept to hard labour. B. a. § 84.

SEVENTH RATE or class of buildings within the limits of the Building-act. B. a. §§ 20, 21. May be built of any dimensions and of any materials whatever, except that they are not to be covered with pitch, tar, or any other inflammable material, and except that crane-houses are to be built of stone, brick, slate, tile, oak, elm, steel, iron, or brass.

1. Crane-houses on wharves or quays.
2. Shambles.
3. Wind-mills.
4. Water-mills.

And buildings situate without the cities of London and Westminster and the liberties thereof, so long only as they are used as workshops or drying-places for

1. Buckram-stiffeners.
2. Calico-printers.
3. Curriers.
4. Fell-mongers.
5. Glue-makers.
6. Leather-dressers.
7. Oil-cloth painters.
8. Paper-makers.
9. Parchment-makers.
10. Size-makers.
11. Tanners.
12. Throwsters.
13. Whisters.
14. Whiting-makers.
15. Wool-staplers.

SEWERS. (See Commissioners of.)

SHAMBLES within the limits of the Building-act are constituted of the 7th rate of building. B. a. § 20.

SHERIFF and UNDER-SHERIFF. (See *Fine.*)

SHOP-FRONTS, projection of. (See *Bow-windows.*)
materials of. (See Copings.)

SIXTH RATE or class of buildings within the limits of the Building-act, B. a. § 19, which may be built of any dimensions and of any materials whatever.

Dwelling-houses, warehouses, stables, and other buildings (*except the* 14 *kinds of buildings which are in all cases of the* 1*st rate*. B. a. § 2.) which are distant 8 feet from any public way, and are 30 feet from any other building not in the same possession therewith; but if afterwards divided into distinct tenures without being separated from each other 30 feet at least, the same shall be deemed public nuisances, and shall be immediately taken down. B. a. § 58.

(*See first rate.*)

SIZE-MAKERS (Buildings without the cities of London and Westminster and the liberties thereof while used by) are by the Building-act constituted of the 7th rate. B. a. § 20.

SLABS OR FOOT-PACES of tile, stone, marble, or iron, at least 18 ins. broad and 1 foot longer than the opening are to be laid to all chimneys, upon brick or stone trimmers at least 18 ins. broad from the chimney-opening or from the perpendicular face of the arch over the chimney-opening, except the same be in a cellar or ground floor and be laid and bedded on the solid earth. B. a. § 45. (See Hearths.)

SOAP-MANUFACTORIES within the limits of the Building-act are constituted of the 1st rate or class of building. B. a. § 2.

STABLES,

1st, The rate of, is determined by the altitude and number of stories. (See 1st, 2nd, 3rd, 4th, 5th, and 6th rates of buildings.)

2nd, No range of, is to contain, including the internal and external walls thereof, more than 25 squares of building of 100 superficial feet each, but communication may be made from one range thereof to another with wrought-iron doors with panels $\frac{1}{4}$ in. thick in stone door-cases and with no timber bond or lintel within 18 ins. of the opening. B. a. § 54.

3rdly, May be divided for the distinct occupation of under-tenants, but are not required to have party-walls unless they contain more than 25 squares of building, in which case party-walls are to be built so as to reduce them to within that dimension. B. a. § 57.

STALL-BOARDS of Shop-windows. (See Bow-windows.)

STEPS. (See Bow-windows.)

STILLS. (See Timber or Wood-work.)

STONE. (See External walls.)

STORY-POSTS and Breast-summers. (See External inclosures.)

STOVES. (See Timber or Wood-work.)

SUGAR REFINING HOUSES are, within the limits of the Building-act, constituted of the first rate or class of buildings. B. a. § 2.

[illegible] applications to the General Quarter Sessions of the County of, concerning any matter to be ordered in pursuance of this Act, the jury and all parties required to attend, are to attend at some general or special adjournment of the said Quarter Sessions within six weeks after such application, in some place in the Borough of Southwark, and every adjournment shall be for less than three weeks. B. a. § 36.

[illegible] within the limits of the Building-act are constituted of the first rate or class of buildings. B. a. § 2.

[illegible] Serpentine.)

[illegible] without the cities of London and Westminster and the liberties thereof, while used by) are by the Building-act constituted of the 7th rate. B. a. § 20.

[illegible] of buildings within the limits of the Building-act. B. a. § 8.

1st. Dwelling-houses from 3½ to 5 squares of 100 superficial feet on their ground stories.

5thly, 6thly, 7thly. Other buildings (not of the 1st, 5th, 6th, or 7th rate) which contain more than one clear story above ground, exclusive of any rooms in the roof thereof, and not more than two clear stories, or which shall be of the height of from 13 to 22 feet from the ground before either of the fronts thereof, to the top of the blocking-course or coping of the parapet: this description of buildings may be made of any dimensions whatsoever on their plans, with the exception of warehouses which are confined to 35 squares of building, and stables which are confined to 25 squares of building: but ranges of warehouses and stables may respectively communicate together by wrought-iron doors and stone door-cases. B. a. § 8.

1st. Not to be let into any party-arch except for bond to the same, nor into any *party-wall*, except the necessary templets, sleepers, and bond-timber, the ends of girders, beams, purlins, bridging or trimming-joists or other principal timbers.

2dly. All timbers to have at least 8½ ins. of solid brick-work between the ends and sides of every such piece of timber and the timber of any building adjoining thereto, but if any such timber shall be opposite to and level with any part of the ends of any timber of any adjoining building, no such timber shall approach within 4 ins. of the centre of the said wall.

Timber to Work-work.

1st. Is not to be laid in the brick-work of nor within 2 feet of the inside of any oven, stove, copper, still, boiler, or furnace, nor within 9 ins. of the inside of any flue thereof, if such timber in the latter case lie nearer than 5 ft. above the mouth of the same. B. a. § 45.

2dly. Is not to be laid within 9 ins. of the *opening of any chimney* or within 3 ins. of the inside of any *flue* thereof. B. a. § 45.

3dly. No wood-work is to be fixed to the front of any jamb or mantle, or to the front of any chimney or flue except by iron nails or hold-fasts, or other iron fastenings which shall not be

driven or fixed more than 3 ins. into the brickwork nor within 4 ins. of the inside of the chimney-opening. B. a. § 45.

-WORK, no chimney is to be erected upon, except piling, bridging, or planking below the foundation, but (with that exception) upon nneys.) solid ground brick or stone foundation, or brick or stone corbeilles, or iron brackets, or iron shores supported on brick or stone foundations. B. a. § 45.

-WORK. (See External inclosures.)

RS. (See Slabs.)

. (See *Water*.)

PARTITIONS are to remain between houses and buildings only till one of the houses or buildings adjoining thereto is rebuilt, or till at least two thirds of one of the fronts is taken down to the breast-summer or one-pair floor, or till condemned. B. a. § 24. (See Party-partitions.)

OCK who shall first turn on the water at a fire shall be paid not exceeding 10*s*. (See *Churchwardens*.) B. a. § 76.

S. (See External walls and inclosures (*old*), also Flats.)

TINE, not more than 10 gallons of, to be distilled at once in any workhouse or place contiguous to any other building, or in any place within 50 feet of any other building, under penalty of 100*l*. to be recoverable with treble costs of suit of which half to go to the poor and the remainder to the informer. B. a. § 72.

By § 1 of the 25th George 3rd, cap. 77, the above restriction is repealed, and the following restrictions are enacted, and are extended to all England:

"*It shall not be lawful for any Person or Persons, within that part of Great Britain called England, to distil or boil any Turpentine or Tar, or to draw any Oil of Turpentine and Rosin by distilling Turpentine, or to draw any Oil of Tar or Pitch by distilling or boiling Tar, or to boil any Oil and Turpentine together, or to boil any Oil and Tar together, above the quantity of Ten Gallons at One Time, of all or any of the said Commodities, in any Workhouse or Place, contiguous to any other Building, or in any place nearer to any other Building than the Distance of Seventy-five feet at the least (except in houses or Buildings now in use for carrying on such Manufactories, and now legally intitled to be used for those Purposes) upon Pain that every Person offending therein shall, for every such Offence, forfeit and pay the sum of One hundred Pounds; which Forfeitures shall and may be recovered, with Treble Costs of Suit, by Action of Debt, Bill, Plaint, or Information, in any of His Majesty's Courts of Record at Westminster, wherein no Essoin, Protection, or Wager of Law, or more than One Imparlance, shall be allowed, One Moiety whereof shall go to the Use of the Poor of the Parish, Precinct, or Place wherein the Offence shall have been committed, and the other Moiety thereof to such Persons as shall sue for the same.*"

And by the 1st and 2nd Victoria, cap. 75, it is enacted that

> "*The Penalties named in the*" last "*recited act shall extend to the owners or occupiers of any Pitch, Tar, or Turpentine Distillery which shall be within the distance of 75 feet from any other building or buildings: but in case the other building or buildings next adjoining to such distillery be occupied jointly by the same tenant, and that the whole of such buildings (including such distillery and the said other building or buildings) so jointly occupied by the said tenant be 75 feet distant from any other building, then the said penalties shall not extend to the occupier or occupiers thereof.*"

TURPENTINE DISTILLERIES within the limits of the Building-act are constituted of the first rate or class of buildings. B. a. § 2.

UNITED PARISHES within the City of London are to be deemed one for the purposes of the Act. B. a. § 79.

VESTRIES. (See Churchwardens, 5thly.)

WAREHOUSES,

1st, Rates of, determined by their altitude and number of stories, see 1st, 2nd, 3rd, 4th, 5th, and 6th rate.

2ndly, No stack of, is to contain, including the internal and external walls thereof, more than 35 squares of building of 100 superficial feet each; but communication may be made from one stack thereof to another with wrought-iron doors with panels at least ¼ in. thick, in stone door-cases, and with no timber, bond, or lintel within 18 ins. of the opening. B. a. § 53.

3rdly, May be divided for the distinct occupation of under-tenants, but are not required to have party-walls unless they contain more than 35 squares of building, in which case party-walls are to be built to reduce them to within that dimension. B. a. § 56.

4thly, Window-frames and door-frames of. (See External inclosures.)

WALLS (*old*) are not to become party-walls to buildings of the 1st, 2nd, 3rd, or 4th rate unless built of the statute thickness from the top of the footings upwards. B. a. § 25.

WATER,

1st, Is not to drip next any public way from the roof of any building of the 1st, 2nd, 3rd, or 4th rate, except from the roofs of porticos, or other entrances.

2ndly, Water is to be conveyed from roofs by gutters or pipes of lead, copper, tin, or iron, or by wooden trunks, but no wooden trunk is to rise above the tops of the windows of the ground story. B. a. § 48.

WATER-COMPANIES. (See Churchwardens.)

WATERMEN to the number of 30 who are retained by an Insurance Company are not to be impressed. B. a. § 82.

WATER-MILLS within the limits of the Building-act are constituted of the 7th rate. B. a. § 20.

WHITING-MAKERS (Buildings without the cities of London and Westminster and the liberties thereof, while used by) are by the Building-act constituted of the 7th rate. B. a. § 20.

WIND-MILLS within the limits of the Building-act are constituted of the 7th rate. B. a. § 20.

WINDOW-DRESSINGS, projections of. (See Bow-windows.)

————————, materials of. (See Copings.)

WINDOW-FRAMES and DOOR-FRAMES are to be let into reveals. (See *External inclosures* for exceptions; see also Flats; see also Warehouses.)

WITNESSES may be *fined* not exceeding 10*l.* for
1st, Refusing to be sworn.
2ndly, Refusing or neglecting to attend and give evidence after 10 days' notice, and tender of reasonable charges and expenses, and are also liable to action for damages.
3rdly, The Court may order witnesses further remuneration before they are compelled to give evidence.

WITNESSES. Parishioners or inhabitants of the place where any offence against the Act is committed, may be. B. a. § 98.

WORKMEN committing breach of the Building-act wilfully, carelessly, or negligently, and without the direction, privity, or consent of the master workman or person causing the work to be done, shall upon conviction forfeit 50*s.* of which half is to be paid to the Overseers of the Poor and the remainder to the informer, and upon failure of payment the offender is to be committed to the house of correction from one to three months. B. a. § 66.

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THE END.

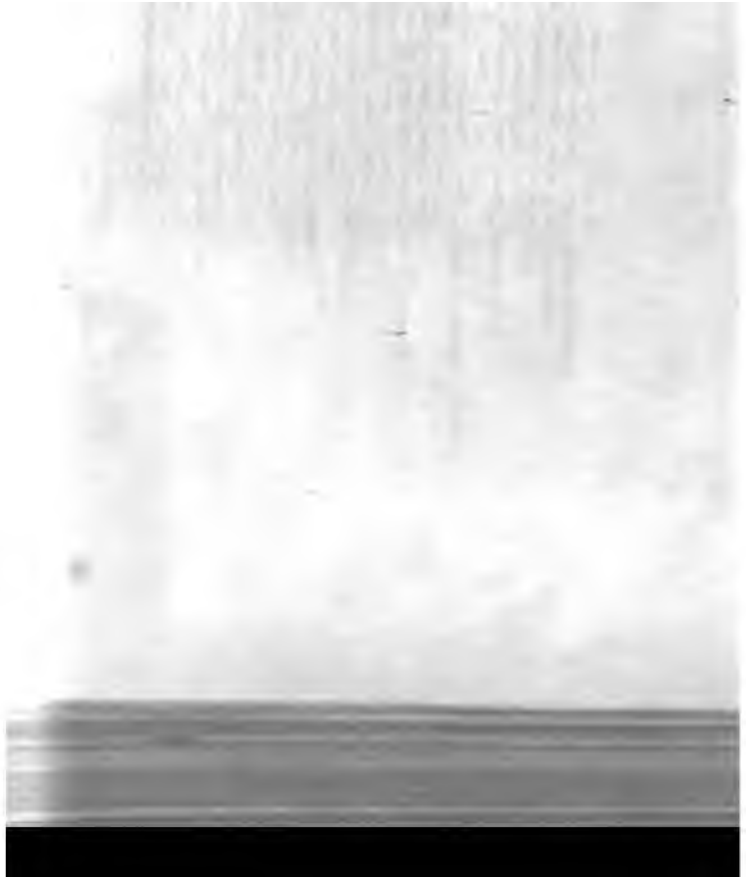
GILBERT & RIVINGTON, Printers, St. John's Square, London.

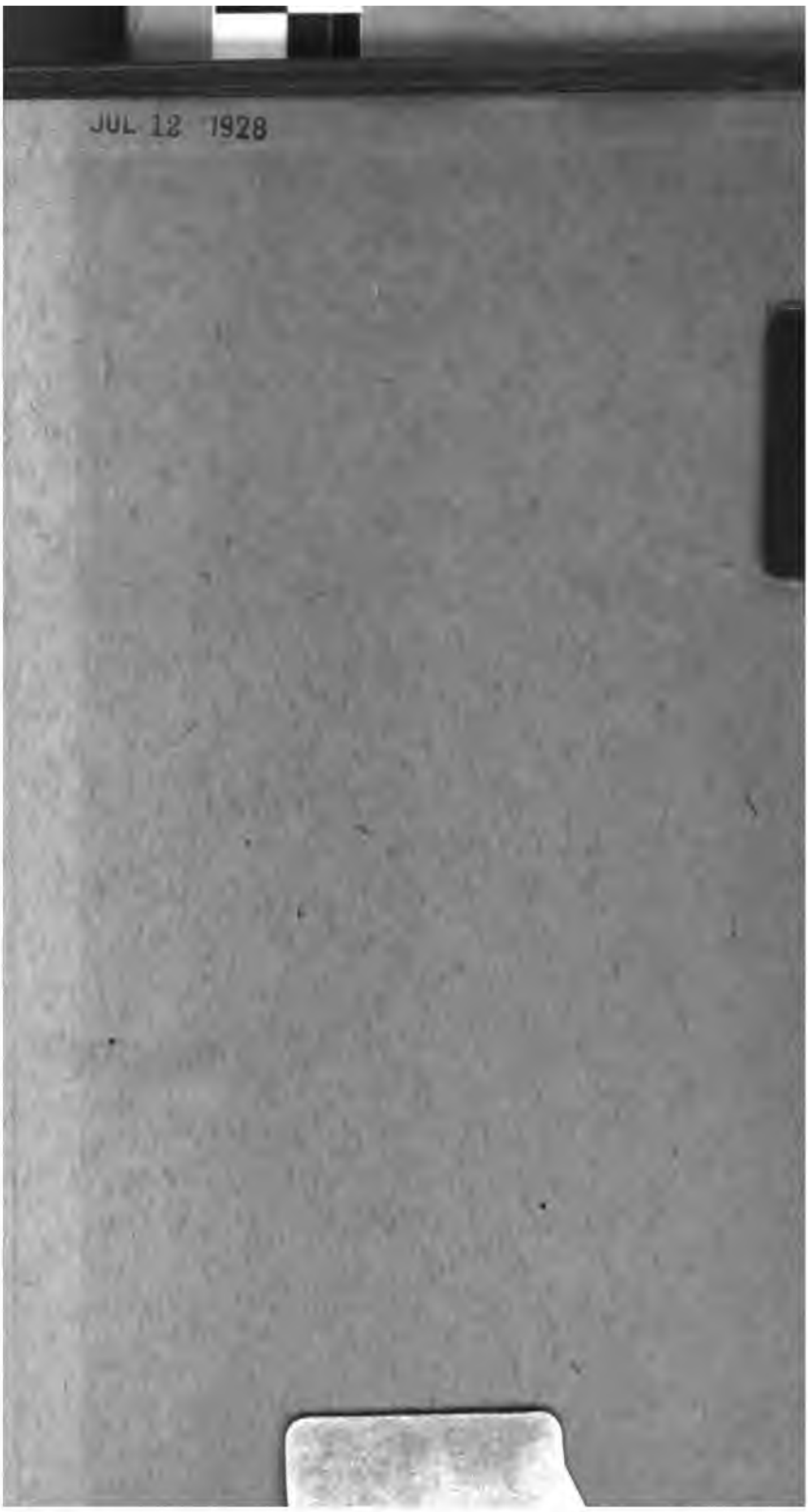
ERRATA.

The kindness of the reader is solicited for correction of the following errors, in addition to any others which may be discovered.

PART II.

SECTION 983, *for* "archictecture," *read* "architecture."
" 1156, *for* "beads," *read* "beaded."
" 1281, *for* "and," *read* "an."
" 1407, *for* "rounded each," *read* "round each."
" 1641, *for* "smoothe," *read* "smooth."
" 1679, *for* "jams," *read* "jambs."
" 1681, *for* "far," *read* "for."
" 1703, *for* "1½ in. cwt.," *read* "1½ cwt."
" 1974, *for* "1½," *read* "1½ in."
" 2167, *for* "hoops," *read* "hooks," twice.
" 2195, *for* "preset," *read* "present."
" 2280, *for* "Aberdeen," *read* "Aberdeen granite."
" 2434, *for* "slips or," *read* "slips of."
" 2539, *for* "joints," *read* "joint."
" 2550, *for* "see §§ 1459, 2419," *read* "see §§ 1453, 2418."
" 2758, *for* "brick-burnt," *read* "brickburnt."
" 2940, omit this sectional number.
" 2941, *for* "2941. To provide," *read* "2940. To provide."
" 2965, *for* "¾," *read* "¾ in."
" 3077, *for* "imperfectly tiled," *read* "imperfectly tied."
" 3110, *for* "18," *read* 18 ins."
" 3187, *for* "stop-holes," *read* "stop holes."
" 3238, *for* "lime-whitings," *read* "lime-whiting."
" 3568, *for* "building-scantling," *read* "building scantling."
" 3577, *for* "recess a," *read* "recess an."

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